



MATHS

BOOKS - INDEPENDENTLY PUBLISHED

MATHS (ENGLISH)

PROBLEM SOLVING AND DATA ANALYSIS

Example

1. What is 15% of 80?



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2. 30% of what number of 12?



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3. 9 is what percentage of 30 ?



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4. If the length of a rectangle is increased by 30% and its width is increased by 10%, by what

percentage will be the area of the rectangle be increased?

A. 0.33

B. 0.37

C. 0.4

D. 0.43

Answer: D



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5. A pair of tennis shoes cost \$48.60 including sales tax. If the sales tax rate is 8%, what is the cost of the tennis shoes before the tax is added?

A. 10

B. 30

C. 40

D. 45

Answer: 45



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6. If the price of an item increase from \$70 to \$84, what is the percent of increase in price?



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7. The ratio of the number of girls to the number of boys in a certain class is 3:5. If there is a total of 32 students in the class, how many girls are in the class?



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8. If the ratio of A to B is 3:5 and the ratio of B to C is 2:7, what is the ratio of A to C?



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9. If $y = kx$, where k is a constant and $y = 27$ when $x = 18$, what is the value of y when $x = 30$?



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10. If 28 pennies weigh 42 grams, what is the weight in grams of 50 pennies?



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11. If $xy = k$, where k is a constant and $y = 21$, when $x = 6$, what is the value of y when $x = 9$?



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12. Four workers can build a house in 9 days. How many days would it take 3 workers to build the same house?



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13. What are the coordinates of the point P in the xy -plane that divides the line segment whose endpoints are $A(-1, 4)$ and $B(4, -6)$ into two segments such that the ratio of AP to PB is 2 to 3?

A. $(1, 0)$

B. $(0, 2)$

C. $(0.5, 1)$

D. $(2.5, -3)$

Answer: A



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14. If 5 cans of soup cost \$1.95, how much do 3 cans of soup cost?



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15. John rode his bicycle to town at the rate of 15 miles per hour. He left the bicycle in town for minor repairs and walked home along the same route at the rate 3 miles per hour. Excluding the time John spent in taking the bike into the repair shop, the trip took 3 hours. How many hours did John take to walk back?



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16. A new printing press can print 5,000 flyers in half the amount of time it take for an older printing press the same 5,000 flayers. Working together, the two printing presses can complete the entire job in 3 hours. How long would it take the faster printing press working alone to complete the job?



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17. If an object is moving at an average rate of speed of $18 \frac{km}{min}$, how many meters does it

travel is 5 seconds?



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18. The average download speed for Max's computer's Internet connection is 30 megabits per second. Assuming no interruptions in Internet service's, what is the best estimate for the maximum number of complete video files that Max can download to his computer in a six hour period if each video file is 4.2 gigabytes in size? (1 megabyte=8 megabits and 1 gigabyte=1,024 megabytes)

A. 15

B. 18

C. 19

D. 21

Answer: B



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19. A certain 4 inch spring stretches 1.5 inches for each ounce of weight attached to it.



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20. A car starts a trip with 20 gallons of gasoline in its tank and consumes gas at a rate of 1 gallon for each 25 miles traveled.



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21. When there are x milligrams of a certain drug in a patient's bloodstream, a patient's heart rate, h , in beats per minute, can be modeled by the equation $h = 60 + 0.5x$. Which statements are true?

I. 10 minutes after taking the drug, the patient's heart rate increase to 75 beats per minute.

II. When the drug is not in the bloodstream, the patient's heart rate is 70 beats per minute.

III. For each 10 milligram increase of the drug in the patient's bloodstream, the patient's heartbeat increase 5 beats per minute.

A. I and II

B. I and III

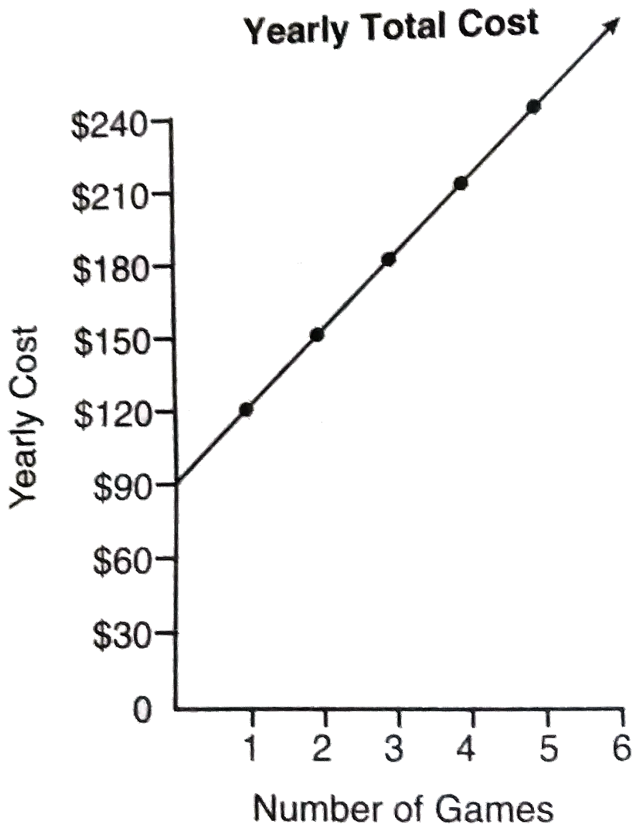
C. II and III

D. I, II, and III

Answer: C



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22.

The graph on page 222 represents the yearly cost of playing 0 to 5 games of golf at the sunybrook Golf Course, which includes the yearly membership fee.

- a. What is the cost of playing one game of golf?
- b. Write a linear functions that expresses the total cost in dollars, C , of joining the club and playing n games during the year. What is the cost of playing 10 games of golf?



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23. The current population of a town is 10,000. If the population, P , increase by 3.5% every six months, which equation could be used to find the population after t years?

$$A. P = 10,000(1.035)^{\frac{t}{2}}$$

$$B. P = 10,000(0.965)^{2t}$$

$$C. P = 10,000(1.035)^{2t}$$

$$D. P = 10,000(0.965)^{\frac{t}{2}}$$

Answer: C



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24. A car loses its value at a rate of 4.5% annually.

If a car is purchased for \$24,500, which equation

can be used to determine the value of the car, V , after 5 years?

A. $V = 24,500(0.045)^5$

B. $V = 24,500(0.55)^5$

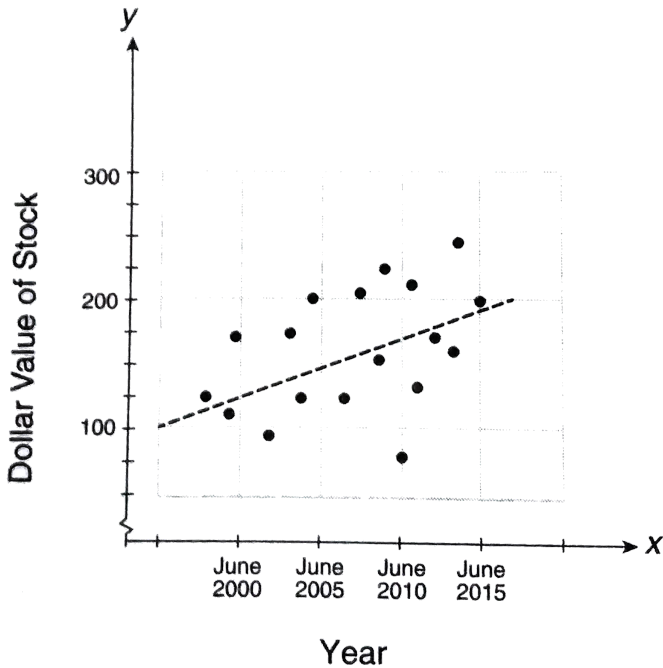
C. $V = 24,500(1.045)^5$

D. $V = 24,500(0.955)^5$

Answer: D



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25.

The graph above shows how the value of a stock has increased over time. The line of best fit is shown.

a. The value of the stock increased from June 2000 to June 2005 by approximately what percent?

A. 0.16

B. 0.2

C. 0.25

D. 0.28

Answer: B



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26. What is the average yearly increase in value of the stock?

A. 1

B. 5

C. 10

D. 25

Answer: B



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27. what is the greatest difference between the actual value of the stock and the value of the stock predicted by the line of best fit?

A. 25

B. 55

C. 75

D. 95

Answer: D



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28. The average of a set of four numbers is 78. If three of the numbers in the set are 71, 74, and 83, what is the fourth number?



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29. The average of w , x , y , and z is 31. If the average of w and y is 24, what is the average of x and z ?



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30. In a class, 18 students had an average midterm exam grade of 85 and the 12 remaining students had an average midterm exam grade

of 90. What is the average midterm exam grade of the entire class?



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31. The price of a toaster was originally x dollars. Later, the toaster went on sale at a 20 percent discount, and was eventually sold for \$50.40 after an additional 10 percent discount off the sale price. What was x , the original price, in dollars, of the toaster?



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32. The following chart shows the cost of one Roku streaming device at a discount store during each of the first 6 months of the year.

Month	January	February	March	April	May	June
Cost	\$200.99	\$195.99	\$150.00	\$150.00	\$135.99	\$120.85

The percent decrease in the cost of the device from January to June was closest to

- A. 12 %
- B. 40 %
- C. 50 %
- D. 60 %

Answer: B



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33. A position-time graph for linear motion of an object in one dimension shows the object's displacement d from some origin at any given time t . If the graph is linear, its slope m is given by

$$m = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } d}{\text{change in } t} = \frac{d_1 - d_2}{t_1 - t_2} = \bar{v},$$

where \bar{v} is the average velocity of the object .

(t_1, d_1) and (t_2, d_2) are any two points on the

line. The graph above is a position time graph for a person who takes a walk from her house .

Which of the following scenarios is consistent with the graph ?

A. After 20 minutes the displacement of the person from her house is approximately

$$230 + 230 + 410 + 900 = 1770 \text{ m}$$

B. The woman reverses direction every 5 minutes during her walk

C. After the first 5 minutes of her walk , the woman stops for 5 minutes . She then

resumes walking.

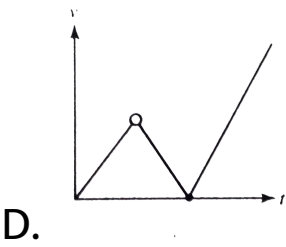
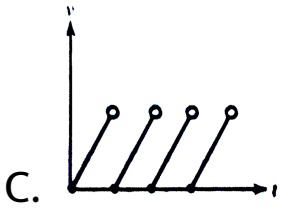
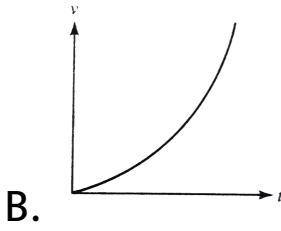
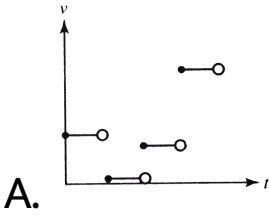
D. The woman stops walking briefly at $t=5$,
 $t=10$ and $t=15$ minutes .

Answer: C



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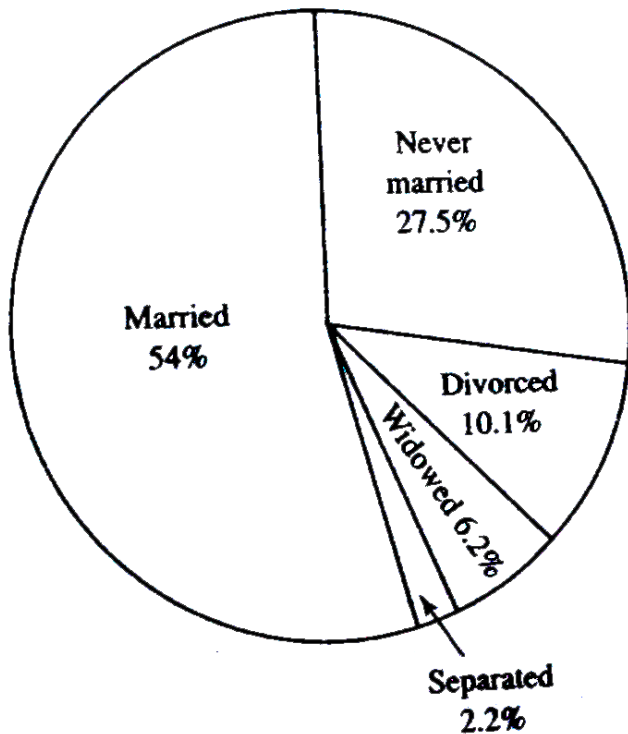
34. Which of the following graphs best describes the velocity of the woman on her walk ?



Answer: A

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Marital Status of U.S. Citizens over 15 in 2003



35.

The graph shows the marital statuses of U.S. citizens ages 15 and over in 2003. If the total number of U.S. citizens over 15 was approximately 222 million in 2003, how many, to

the nearest million , were divorced or separated

?

A. 3 million

B. 10 million

C. 22 million

D. 27 million

Answer: D



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36. The Hadleys took a car trip to visit relatives . Mr. Hadley drove for 2 hours and covered 100 miles . For the last 60 miles , the teenage son, Hank , drove . He took 1 hour to complete this leg of the trip. What was the average speed (arithmetic mean) , in miles per hour , for the trip ?

A. 50

B. $53\frac{1}{3}$

C. 55

D. $56\frac{2}{3}$

Answer: B



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37. In a certain school district , teachers are allowed to take three personal days, at full pay , during one school year. Here is a summary of the number of personal days taken by teachers in 2013-2014 .

Number of Teachers Who Took Personal Days	Number of Personal Days Taken by Those Teachers
Fewer than 10	0
50	1
200	2
85	3

From this table you can accurately find

I. the arithmetic mean of personal days taken

II. The median number of personal days taken

III. The mode of the number of personal days taken

A. I only

B. II only

C. III only

D. II and III only

Answer: D



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38. The scores on the SAT math test have a normal distribution with an overall mean of about 500 and standard deviation of 100 for all test takers . Jamal earned a score of 600 for his SAT maths test. Approximately what percentage of test takers earned a higher score ?

A. 2.5

B. 5

C. 16

D. 32

Answer: C



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39.

							Total
Absences	0-3	4-6	7-10	11-14	15-18	19-22	.
Frequency	2	4	10	15	9	3	43

The frequency chart above shows number of absences for employees for a small business in a given year. The total number of employees was 43 . The following year , the employees are the same , and two employees are picked at random for an interview . What is the

probability that both employees were absent
between 11 and 14 times the previous year ?

A. $\frac{2}{43}$

B. $\frac{15}{43}$

C. $\frac{5}{43}$

D. 0.116

Answer: C::D



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40. A large health club with more than 5,000 members has a swimming pool , weight room , aerobic classes , and a gym, not all of which are used by all of the members . A staff member conducted a survey concerning the temperature of the weight room . For one month, every tenth member who signed in at the club was asked if the weight room temperature was too high , too low , or just right . Which of the following factors is most likely to invalidate the conclusion drawn about the temperature of the weight room ?

A. The membership size

B. The sample size

C. The number of people who refused to respond

D. The composition of the sample

Answer: D

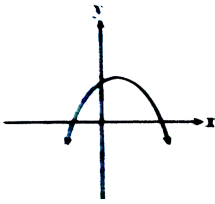


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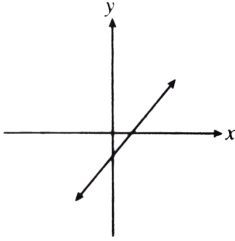
41. Which of the following could be the graph of

$$y = 3^{-2x} ?$$

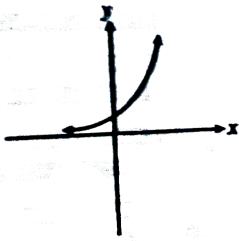
A.



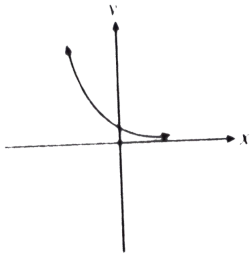
B.



C.



D.



Answer: D



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Multiple Choice

1. By the end of the school year. Terry had passed 80% of his science tests. If Terry failed 4 science tests, how many science tests did Terry pass?

A. 12

B. 15

C. 16

D. 18

Answer: C



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2. A soccer team has played 25 games and has 60% of the games it has played. What is the minimum number of additional games the team must win in order to finish the season winning 80% of the games it has played?

A. 28

B. 25

C. 21

D. 18

Answer: B



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3. In a movie theater, 480 of the 500 seats were occupied. What percent of the seats were NOT occupied?

A. 0.40 %

B. 2 %

C. 4 %

D. 20 %

Answer: C



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4. In a certain mathematics class, the part of the class that are members of the math club is 50% of the rest of that class. The total number of math club members in this class is what percent of the entire class?

A. 20 %

B. 25 %

C. $33\frac{1}{3}$ %

D. 50 %

Answer: C



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5. After 2 months on a diet, John's weight dropped from 168 pounds to 147 pounds. By what percent did John's weight drop?

A. $12\frac{1}{2}\%$

B. $14\frac{2}{7}\%$

C. 21%

D. 25%

Answer: A



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6. If 1 cup of milk is added to a 3-cup mixture that is $\frac{2}{3}$ flour and $\frac{3}{5}$ milk, what percent of the 4-cup mixture is milk?

A. 80 %

B. 75 %

C. 70 %

D. 65 %

Answer: C



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7. If the result of increasing a by 300% of a is b , then a is what percent of b ?

A. 20 %

B. 25 %

C. $33\frac{1}{3}$ %

D. 40 %

Answer: B



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8. After a 20% increase, the new price of a radio is \$78.00. What was the original price of the radio?

A. \$15.60

B. \$60.00

C. \$62.40

D. \$65.00

Answer: D



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9. After a discount of 15%, the price of a shirt is \$51. What was the original price of the shirt?

A. \$44.35

B. \$58.65

C. \$60.00

D. 64.00

Answer: C



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10. Three students use a computer for a total of 3 hours. If the first student uses the computer 28% of the total time, and the second student

uses the computer 52% of the total time, how many minutes does the third student use the computer?

A. 24

B. 30

C. 36

D. 42

Answer: C



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11. In an opinion poll of 50 men and 40 women 70% of the men and 25% of the women said that they preferred fiction of nonfiction books. What percent of the number of people polled preferred to read fiction?

A. 40 %

B. 45 %

C. 50 %

D. 60 %

Answer: C



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12. In a factory that manufactures light bulbs, 0.04% of all light bulbs manufactured are defective. On the average, there will be three defective light bulbs out of how many manufactured?

A. 2, 500

B. 5, 000

C. 7, 500

D. 10, 000

Answer: C



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13. A used-car lot has 4-door sedans, 2-door sedans, sports cars, vans, and jeeps. Of these vehicles, 40% are 4-door sedans, 25% are 2-door sedans, 20% are sports cars, 10% are vans, and 10 of the vehicles are jeeps. If this car lot has no other vehicles, how many vehicles are on the used-car lot?

A. 300

B. 400

C. 480

D. 600

Answer: B



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14. Jack's weight first increased by 20% and then his new weight decreased by 25%. His final weight is what percent of his beginning weight?

A. 95 %

B. 92.5 %

C. 90 %

D. 88.5 %

Answer: C



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15. The price of a stock falls 25%. By what percent of the new price must the stock price rise in order to reach its original value?

A. 25 %

B. 30 %

C. $33\frac{1}{3}$ %

D. 40 %

Answer: C



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VOTING POLL	
Candidate A	30%
Candidate B	50%
Undecided	20%

16.

The table above summarizes the result of an

election poll in which 4,000 voters participated. In the actual election, all 4,000 of these people voted, and those people who chose a candidate in the poll voted for that candidate. People who were undecided voted for candidate A in the same proportion as the people who cast votes for candidates in the poll. Of the people polled, how many voted for candidate A in the actual election?

A. 1, 420

B. 1, 500

C. 1, 640

D. 1, 680

Answer: B



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17. A car starts a trip with 20 gallons of gas in its tank. The car traveled at an average speed of 65 miles per hour for 3 hours and consumed gas at a rate of 30 miles per gallon. What percent of the gas in the tank was used for the 3-hour trip?

A. 32.5

B. 33.0

C. 33.5

D. 34.0

Answer: A



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18. A recipe for 4 servings requires salt and pepper to be added in the ratio of 2:3. If the recipe is adjusted from 4 to 8 serving, what is

the ratio of the salt and pepper that must now be added?

A. 4 : 3

B. 2 : 6

C. 2 : 3

D. 3 : 2

Answer: C



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19. On a certain map, $\frac{3}{8}$ of an inch represents 120 miles. How many miles does $1\frac{3}{4}$ inches represent?

A. 300

B. 360

C. 480

D. 560

Answer: D



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20. The population of a bacteria culture doubles in number every 12 minutes. The ratio of the number of bacteria at the end of 1 hour to the number of bacteria at the beginning of that hour is

A. 64: 1

B. 60: 1

C. 32: 1

D. 16: 1

Answer: C



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21. At the end of the season, the ratio of the number of games team has won to the number of games it lost is 4:3. If the team won 12 games and each game played ended in either a win or lose, how many games did the team play during season?

A. 9

B. 15

C. 18

D. 21

Answer: D



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22. If s and r are integers, $8 < r < 40$, and

$\frac{s}{r} = \frac{4}{7}$, how many possible values are there for

s ?

A. Two

B. Three

C. Four

D. Five

Answer: C



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23. A school club includes only sophomores, juniors, and seniors, in the ratio of 1:3:2. If the club has 42 members, how many seniors are in the club?

A. 6

B. 7

C. 12

D. 14

Answer: D



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24. If $\frac{c - 3d}{4} = \frac{d}{2}$, what is the ratio of c to d?

A. 5 : 1

B. 3 : 2

C. 4:3

D. 3:4

Answer: A



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25. If 4 pairs of socks costs \$10.00, how many pairs of socks can be purchased for \$22.50?

A. 5

B. 7

C. 8

D. 9

Answer: D



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26. Two boys can paint a fence in 5 hours. How many hours would it take 3 boys to paint the same fence?

A. $\frac{3}{2}$

B. 3

C. $3\frac{1}{3}$

D. $4\frac{2}{3}$

Answer: C



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27. A car moving at a constant rate travels 96 miles in 2 hours. If the car maintains this rate, how many miles will the car travel in 5 hours?

A. 480

B. 240

C. 210

D. 192

Answer: B



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28. The number of kilograms of corn needed to feed 5,000 chickens is 30 less than twice the number of kilograms needed to feed 2,800 chickens. How many kilograms of corn are needed to feed 2,800 chickens?

A. 70

B. 110

C. 140

D. 190

Answer: C



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29. The number of calories burned while jogging varies directly with the number of minutes spent jogging. If George burns 180 calories by

jogging for 25 minutes, how many calories does he burn by jogging for 40 minutes?

A. 200

B. 276

C. 288

D. 300

Answer: C



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30. If y varies directly as x and $y=12$, where $x=c$, what is y in terms of c when $x=8$?

A. $\frac{2c}{3}$

B. $\frac{3}{2c}$

C. $20c$

D. $\frac{96}{c}$

Answer: D



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31. $\frac{x}{z} = \frac{1}{3}$

If in the equation above x and z are integers

which are possible values of $\frac{x^2}{z}$?

I. $\frac{1}{9}$

II. $\frac{1}{3}$

III. 3

A. II only

B. III only

C. I and III only

D. II and III only

Answer: D



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32. If $a - 3b = 9b - 7a$, then the ratio of a to b is

A. 3 : 2

B. 2 : 3

C. 3 : 4

D. 4 : 3

Answer: A



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33. The ratio of A to B is $a : 8$, and the ratio of B to C is $12 : c$. If the ratio of A to C is $2 : 1$, what is the ratio of a to c ?

A. $2 : 3$

B. $3 : 2$

C. $4 : 3$

D. $3 : 4$

Answer: C



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34. If $8^r = 4^t$, what is the value of r to t ?

A. 2 : 3

B. 3 : 2

C. 4 : 3

D. 3 : 4

Answer: A



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35. If $\frac{a + b}{4} = 4$ and $\frac{a + c}{c} = 3$, what is the ratio of c to b ?

A. 2 : 3

B. 3 : 2

C. 2 : 1

D. 3 : 1

Answer: B



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36. In a certain collage, the ratio of mathematics majors to English majors is 3:8. If in the following school year the number of mathematics majors increase 20%, and the number of English majors decrease 15%, what is the new ratio of mathematics majors to English majors?

A. 4:9

B. 1:2

C. 9:17

D. 17:32

Answer: C



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37. At a collage basketball game, the ratio of the number of freshmen who attended to the number of juniors who attended is 3:4. The ratio of the number of juniors who attended to the number of seniors who attended is 7:6. What is the ratio of the number of freshmen to

the number of seniors who attended the basketball game?

A. 7:8

B. 3:4

C. 2:3

D. 1:2

Answer: A



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38. If took 12 men 5 hours to build an airstrip. Working at the same rate, how many additional men could have been hired in order for the job to have taken 1 hour less?

- A. Two
- B. Three
- C. Four
- D. Six

Answer: B



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39. If x represents a number picked at random from the set $\{-3, -2, -1, 0, 1, 2\}$, what is the probability that x will satisfy the inequality $4 - 3x < 6$?

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{1}{2}$

D. $\frac{2}{3}$

Answer: C



40. What are the coordinates of the point P in the xy -plane that divides the line segment whose endpoints are $A(-2, 9)$ and $B(7, 3)$ into two segments such that the ratio of AP to PB is 1 to 2?

A. $P(1, 5)$

B. $P(4, 1)$

C. $P(1, 7)$

D. $P(2, 6)$

Answer: C



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41. If four pens cost \$1.96, what is the greatest number of pens that can be purchased for \$7.68?

A. 12

B. 14

C. 15

D. 16

Answer: C



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42. Two pipes of different diameters may be used to fill a swimming pool. The pipe with the larger diameter working alone can fill the swimming pool 1.25 times faster than the other pipe when it works alone. One hour after the larger pipe is opened, the smaller pipe is opened, and the swimming pool is filled 5 hours later. Which equation could be used to find the

number of hours, x , it would take for the larger pipe to fill the pool working alone?

A. $\left(\frac{1}{1.25x}\right)5 + \left(\frac{1}{x}\right)6 = 1$

B. $\left(\frac{1}{x}\right)5 + \left(\frac{1}{1.25x}\right)6 = 1$

C. $\left(\frac{x}{5}\right)1.25 + \left(\frac{x}{6}\right) = 1$

D. $\left(\frac{x}{5}\right) + \left(\frac{x}{6}\right)1.25 = 1$

Answer: A



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43. On the certain map, 1.5 inches represents a distance of 120 miles. If two cities on this map are 1 foot apart, what is the distance, in miles, between the cities?

A. 180

B. 480

C. 960

D. 1, 080

Answer: C



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44. A freight train left a station at 12 noon, going north at a rate of 50 miles per hour. At 1:00 P.M. a passenger train left the same station, going south at a rate of 60 miles per hour. At what time were the trains 380 miles apart?

A. 3:00 P.M.

B. 4:00 P.M.

C. 4:30 P.M.

D. 5:00 P.M.

Answer: B



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45. A man drove to work at an average rate of speed of 60 miles per hour and returned over the same route driving at an average rate of speed of 40 miles per hour. If his total driving time was 1 hour, what was the total number of miles in the round trip?

A. 12

B. 24

C. 30

D. 48

Answer: D



Watch Video Solution

46. If x people working together at the same rate can complete a job in h hours, what part of the same job can one person working alone complete in k hours?

A. $\frac{k}{xh}$

B. $\frac{h}{xk}$

C. $\frac{k}{x + h}$

D. $\frac{kh}{x}$

Answer: A



Watch Video Solution

47. An electrician can install 5 light fixtures in 3 hours. Working at that rate, how long will it take the electrician to install 8 light fixtures?

A. $3\frac{4}{5}$ hours

B. $4\frac{1}{5}$ hours

C. $4\frac{1}{2}$ hours

D. $4\frac{4}{5}$ hours

Answer: D



Watch Video Solution

48. A freight train and a passenger train start toward each other at the same time from two towns that are 500 miles apart. After 3 hours,

the trains are still 80 miles apart. If the average rate of speed of the passenger train is 20 miles per hour faster than the average rate of speed of the freight train, what is the average rate of speed, in miles per hour, of the freight train?

A. 40

B. 45

C. 50

D. 60

Answer: D



Watch Video Solution

49. One machine can seal 360 packages per hour, and an other machine can seal 140 package per hour. How many MINUTES will the two machines working take will the two machines working together take to seal a total of 700 package?

A. 48

B. 72

C. 84

D. 90

Answer: C



Watch Video Solution

50. A motot boat traveling at 18 miles per hour traveled the length of a lake in one-quarter of an hour less time than it took when travelling at 12 miles per hour. What was the length in miles of the lake?

A. 6

B. 9

C. 12

D. 15

Answer: B



Watch Video Solution

51. Carmen went on a trip of 120 miles, traveling at an average of x miles per hour. Several days later she returned over the same route at a rate that was 5 miles per hour faster than her previous rate. If the time for the return trip was

one-third of an hour less than the time for the outgoing trip, which equation can be used to find the value of x ?

A. $\frac{120}{x + 5} = \frac{1}{3}$

B. $\frac{x}{120} = \frac{x + 5}{120} - \frac{1}{3}$

C. $\frac{120}{x + (x - 5)} = \frac{1}{3}$

D. $\frac{120}{x} = \frac{120}{x + 5} + \frac{1}{3}$

Answer: D



Watch Video Solution

52. Jonathan drove to the airport to pick up his friend. A rainstorm forced him to drive at an average speed of 45 miles per hour, reaching the airport in 3 hours. He drove back home at an average speed of 55 miles per hour. How long, to the nearest tenth of an hour, did trip home take him?

A. 2.0 hours

B. 2.5 hours

C. 2.8 hours

D. 3.7 hours

Answer: B



Watch Video Solution

53. A plumber works twice as fast as his apprentice. After the plumber has worked alone for 3 hours, his apprentice joins him and working together they complete the job 4 hours later. How many hours would it have taken the plumber to do the entire job by himself?

A. 9

B. 12

C. 14

D. 18

Answer: A



Watch Video Solution

54. Which expression could be used to change 8 kilometers per hour to meters per minutes?

A. $\frac{8 \text{ km}}{\text{hr}} \times \frac{1 \text{ km}}{1,000 \text{ m}} \times \frac{1 \text{ hr}}{60 \text{ min}}$

$$\text{B. } \frac{8 \text{ km}}{\text{hr}} \times \frac{1,000 \text{ m}}{1 \text{ km}} \times \frac{60 \text{ min}}{1 \text{ hr}}$$

$$\text{C. } \frac{8 \text{ km}}{\text{hr}} \times \frac{1,000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$\text{D. } \frac{8 \text{ km}}{\text{hr}} \times \frac{1 \text{ km}}{1,000 \text{ m}} \times \frac{60 \text{ min}}{1 \text{ hr}}$$

Answer: C



Watch Video Solution

55. Which expression represents 72 kilometers per hour expressed as meters per hour?

A. 7.2×10^{-2}

B. 7.2×10^2

C. 7.2×10^{-3}

D. 7.2×10^4

Answer: D



Watch Video Solution

56. If the mass of a proton is 1.67×10^{-24} gram, what is the number of grams in the mass of 1,000 protons?

A. 1.67×10^{-27}

B. 1.67×10^{-23}

C. 1.67×10^{-22}

D. 1.67×10^{-21}

Answer: D



Watch Video Solution

57. There are 12 players on a basketball team. Before a game, both ankles of each player are taped. Each roll of tape will tape three ankles. Which product can be used to determine the

number of rolls of tape needed to tape the player's ankles?

A. $12 \text{ players} \cdot \frac{1 \text{ player}}{2 \text{ ankles}} \cdot \frac{3 \text{ ankles}}{1 \text{ roll}}$

B. $12 \text{ players} \cdot 2 \text{ ankles} \cdot \frac{3 \text{ rolls}}{1 \text{ ankle}}$

C. $12 \text{ players} \cdot \frac{1 \text{ roll}}{3 \text{ players}} \cdot \frac{3 \text{ ankles}}{\text{roll}}$

D. $12 \text{ players} \cdot \frac{2 \text{ ankles}}{1 \text{ player}} \cdot \frac{1 \text{ roll}}{3 \text{ ankles}}$

Answer: D



Watch Video Solution

58.

$$\frac{40 \text{ yd}}{4.5 \text{ sec}} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \cdot \frac{5,280 \text{ ft}}{1 \text{ mi}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$$

A sprinter who can run the 40-yard dash in 4.5 seconds converts his speed into miles per hour, using the product above. Which fraction in the product is incorrectly written to convert his speed?

A. $\frac{3 \text{ ft}}{1 \text{ yd}}$

B. $\frac{5,280 \text{ ft}}{1 \text{ mi}}$

C. $\frac{60 \text{ sec}}{1 \text{ min}}$

D. $\frac{60 \text{ min}}{1 \text{ hr}}$

Answer: B



Watch Video Solution

59. A star constellation is approximately 3.1×10^4 light years from Earth. One light year is about 5.9×10^{12} miles. What is the approximately distance, in miles, between Earth and the constellation.

A. 1.83×10^{17}

B. 9.0×10^{49}

C. 1.9×10^8

D. 9.0×10^{16}

Answer: A



Watch Video Solution

60. An eye medication that is used to treat increased pressure inside the eye is packaged in 2.5 milliliter bottles. During the manufacturing process, a 10 decaliter capacity bin is used to fill the bottles. If 1 decaliter is equivalent to 10 liters

and 1 liter is equivalent to 1,000 milliliters, what is the maximum number of bottles that can be filled?

A. 4×10^5

B. 4×10^4

C. 2.5×10^3

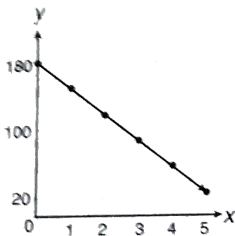
D. 2.5×10^2

Answer: B

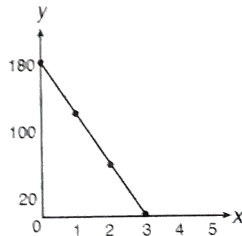


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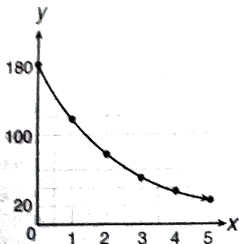
61. On January 1, a share of a certain stock costs of \$180. Each month decreased by one-third. If x represents the time, in months, and y represents the cost of the stock, in dollars, which graph best represents the cost of a share over the following 5 months?



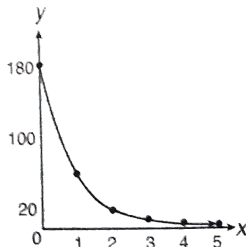
Graph A



Graph B



Graph C



Graph D

A. Graph A

B. Graph B

C. Graph C

D. Graph D

Answer: C



Watch Video Solution

62. A certain population of insects starts at 16 and doubles every 6 days. What is the population after 60 days?

A. 2^6

B. 2^{10}

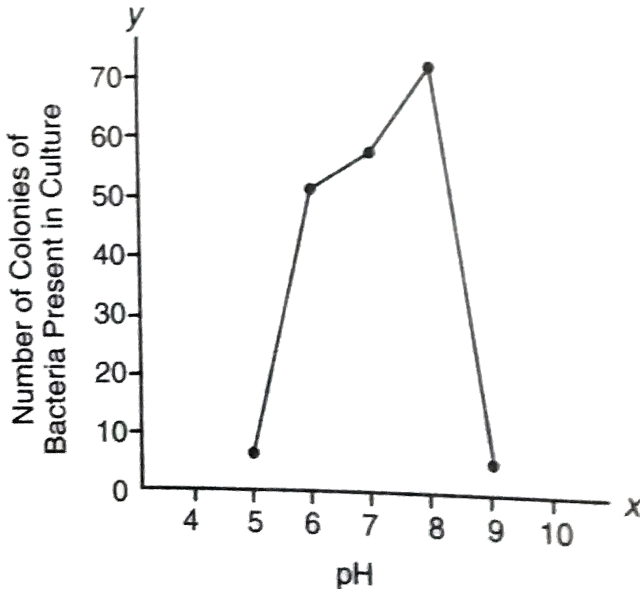
C. 2^{14}

D. 2^{32}

Answer: C



Watch Video Solution



63.

The accompanying graph illustrates the presence of a certain strain of bacteria at various pH levels. Between which two pH values is the rate at which the number of colonies of bacteria increasing at the lowest rate?

A. 5 to 6

B. 6 to 7

C. 7 to 8

D. 8 to 9

Answer: B



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64. After a single sheet of paper is folded in half, there are two layers of paper. The same sheet of paper is repeatedly folded in half. If function f represents the number of layers of paper that

result when the original sheet of paper is folded a total of x times, then which equation could represent this function?

A. $f(x) = 2x$

B. $f(x) = x^2$

C. $f(x) = 2^x$

D. $f(x) = 4^{\frac{x}{2}}$

Answer: C



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65. The yearly growth in the number of fast food restaurants by the function $f(n)=5+8n$. According to this model which statement is true?

A. 8 is the initial number of restaurants, 5 is the number of restaurants added each year after the first year.

B. 5 is the starting number of restaurant: 8 is the number of restaurant added each year after the first year.

C. The result chain opened with 13 restaurant

D. The y-intercept of the graph of function f shows the year in which the retail chain made a zero profit.

Answer: B



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$$66. C = 60 + 0.05d$$

The equation above represents the total

monthly cost, C , in dollars of a data plan offered by a cell phone company when the data usage in a month exceeds a 1 gigabyte limit by d megabytes. According to the model, what is the meaning of 0.05?

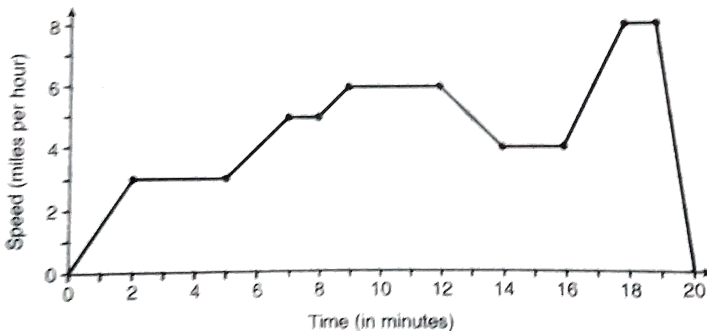
- A. The cost per megabyte of data used
- B. The cost per gigabyte of data used
- C. The cost per megabyte of data after one gigabyte of data is used.
- D. The cost of each additional gigabyte of data after the first megabyte of data is

used.

Answer: C



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67.

The graph above represents a jogger's speed during her 20-minutes jog around her neighbourhood. Which statement best

describes what the jogger was doing during the 9-12 minutes interval of her jog?

- A. She was standing still
- B. She was increasing her speed
- C. She was decreasing her speed
- D. She was jogging at a constant rate.

Answer: D



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68. If a_n represents the n th term of the sequence $45, 18, 6, \dots$, and a_1 represents the first term, then $a_n =$

A. $6 \left(\frac{1}{3} \right)^n$

B. $6 \left(\frac{1}{3} \right)^{n-1}$

C. $54 \left(\frac{1}{3} \right)^n$

D. $54 \left(\frac{1}{3} \right)^{n-1}$

Answer: D



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69. The owner of a small computer repair business has one employee, who is paid an hourly rate of \$22. The owner estimate his weekly profit using the function $P(x) = 8,600 - 22x$. In this function, x represents the number of

- A. Computers repaired per week
- B. employee's hours worked per week
- C. customers served per week
- D. days worked per week

Answer: B



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70. The breakdown of a sample of a chemical compounds is represented by the function $p(n) = 300(0.5)^n$, where $p(n)$ represents the number of milligrams of the substance that remains at the end of n years. Which of the following is true?

I. 300 represents the number of milligrams of the substance that remains after the first year.

II. 0.5 represents the fraction of the starting amount by which the substance gets reduced by the end of each year.

III. Each year the substance gets reduced by one-half of 300.

A. I only

B. II only

C. I and III only

D. II and III only

Answer: B



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71. Some banks charge a fee on saving accounts that are left inactive for an extended period of time. The equation $y = 5,000(0.98)^x$ represents the value, y , of one account that was left inactive for a period of x years. What is the y -intercept of this equation and what does it represent?

A. 0.98 the percent of money in the account initially

B. 0.98, the percent of money in the account
after x years

C. 5,000, the amount of money in the
account initially

D. 5,000, the amount of money in the
account after x years.

Answer: C



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72. Chris plans to purchase a car that loses its value at a rate of 14% per year. If the initial cost of the car is \$27,000, which of the following equations should Chris use to determine the value, v , of the car after 4 years?

A. $v = 27,000(1.14)^4$

B. $v = 27,000(0.14)^4$

C. $v = 27,000(0.86)^4$

D. $v = 27,000(0.86 \times 4)$

Answer: C



73. Vanessa plans to invest \$10,000 for 5 years at an annual interest rate of 6% compounded annually. Which equation could be used to determine the profit, P , Vanessa earns from her initial investment?

A. $P = 10,000 \times (0.6)^5$

B. $P = 10,000 \times \left[(1.06)^5 - 1 \right]$

C. $P = 10,000 \times \left[(1.06)^5 + 1 \right]$

D. $P = 10,000 \times [5(1.06) - 1]$

Answer: B



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74. Miriam and Jessica are growing bacteria in a laboratory. Miriam uses the growth function $f(t) = n^{2t}$ to model her experiment while Jessica uses the function $g(t) = \left(\frac{n}{2}\right)^{4t}$ to model her experiment. In each case, n represents the initial number of bacteria, and t is the time, in hours. If Miriam starts with 6

bacteria, how many bacteria should Jessica start with to achieve the same growth over time?

A. 32

B. 16

C. 8

D. 4

Answer: C



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75. The number of square units, A , in the area covered by a bacteria culture is increasing at a rate of 20% every 7 days. If the bacteria culture initially covers an area of 10 square centimeters, which equation can be used to find the number of square units in the area covered by the bacteria culture after d days?

A. $A = 10(1.20)^{\frac{d}{7}}$

B. $A = 10(1.20)^{7d}$

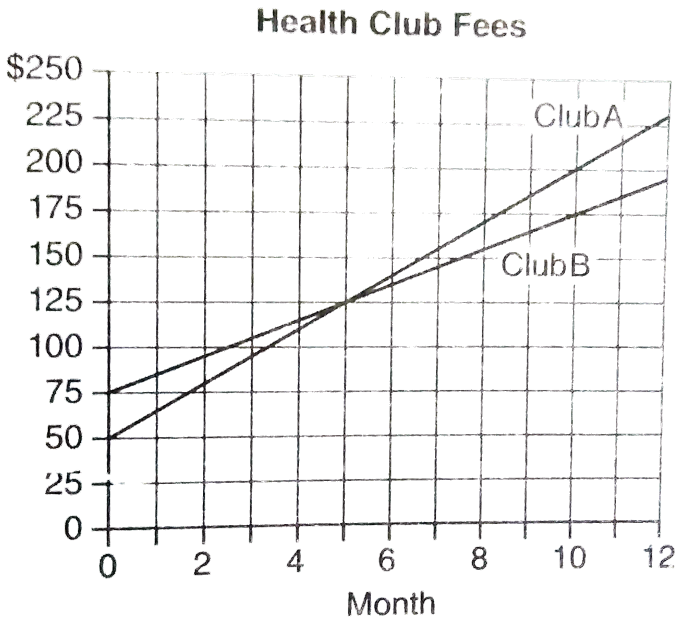
C. $A = 10(0.80)^{\frac{d}{7}}$

D. $A = (12)^{7d}$

Answer: A



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76.

Two health clubs offer different membership plans. The accompanying graph represents the

total yearly cost of belonging to Club a and Club B for one year. The yearly cost includes a membership fee plus a fixed monthly charge. By what amount does the monthly charge for Club A exceed the monthly charge for Club B?

A. 5

B. 7.5

C. 10

D. 12.5

Answer: A



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x	y
0.5	9.0
1	8.75
1.5	8.5
2	8.25
2.5	8.0

77.

Based on the data in the table above, which statements is true about the rate of change of y with respect to x ?

A. It is constant and equal to $\frac{1}{8}$

B. It is constant and equal to 2.

C. It is constant and equal to $-\frac{1}{2}$.

D. It is not constant

Answer: C



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78. The City Tunnel and Bridge Authority in a certain city estimates that 40,000 vehicles currently travel over a certain bridge per year

but, due to highway construction and changing traffic patterns, vehicles traffic over the bridge will begins to decline by 12% every 5 year. Which of the following expressions best represents the vehicles the traffic projections for this bridge n years from now?

A. $40,000(0.12)^{\frac{n}{5}}$

B. $40,000(0.88)^{5n}$

C. $40,000(0.12)^{5n}$

D. $40,000(0.88)^{\frac{n}{5}}$

Answer: D



79. Which of the accompanying tables that show how population is changing over time illustrate exponential decay?

Time (months)	Population
0	10,000
6	7,000
12	4,000
18	1,000

Table I

Time (months)	Population
0	10,000
6	5,000
12	2,500
18	1,250

Table II

Time (months)	Population
0	10,000
6	20,000
12	40,000
18	80,000

Table III

Time (months)	Population
0	10,000
6	15,000
12	20,000
18	25,000

Table IV

A. Table I

B. Table II

C. Table III

D. Table IV

Answer: B



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80. A radioactive substance has an initial mass of 100 grams, and its mass is reduced by 40% every 5 year. Which could be used to find the

number of grams in the mass, y , that remains after x years?

A. $y = 100(0.4)^{5x}$

B. $y = 100(0.6)^{5x}$

C. $y = 100(0.4)^{\frac{x}{5}}$

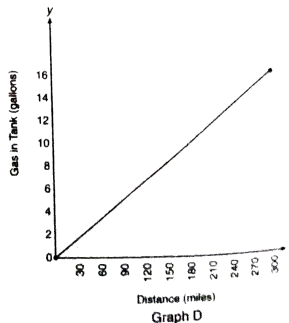
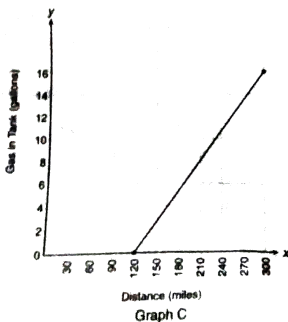
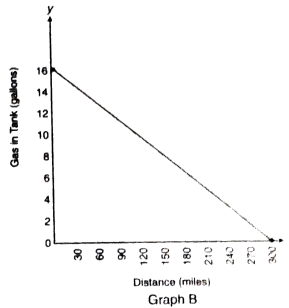
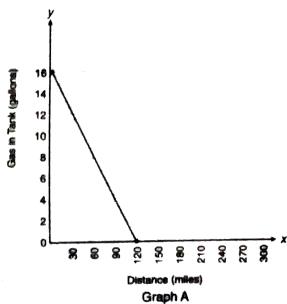
D. $y = 100(0.6)^{\frac{x}{5}}$

Answer: D



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81. The gas tank in a car holds a total of 16 gallons of gas. The car travels 75 miles on 4 gallons of gas. If the gas tank is full at the beginning of a trip, which graph represents the rate of change in the amount of gas in the tank?



A. Graph A

B. Graph B

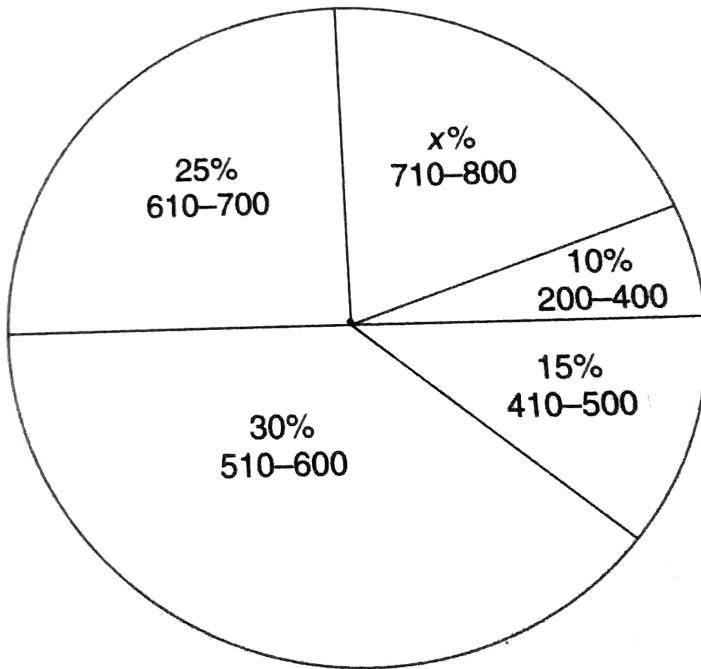
C. Graph C

D. Graph D

Answer: B



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82.

Q. If there are 72 SAT Math scores between 510 and 600, how many SAT Math scores are above 700?

A. 40

B. 48

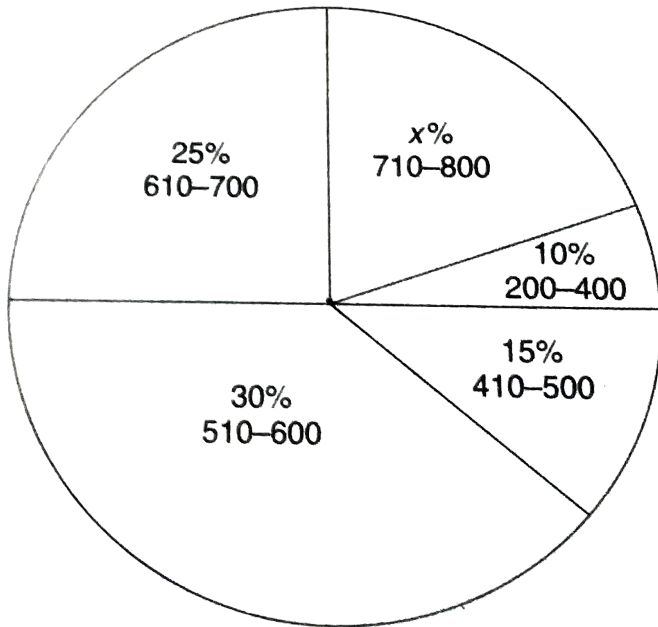
C. 56

D. 76

Answer: B



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83.

Q. If 20% of the students with SAT Math scores from 610 to 700 received collage scholarships, how many students with SAT Math scores from 610 to 700 received collage scholarships?

A. 12

B. 18

C. 30

D. 48

Answer: A



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Minimum Age Requirement (years)	Number of States
14	7
15	12
16	27
17	2
18	2

84.

Q. The table shows the minimum age

requirement for obtaining a driver's license. In what percent of the states can a person obtain a driver's license before the age of 16?

A. 94 %

B. 47 %

C. 38 %

D. 19 %

Answer: C



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Minimum Age Requirement (years)	Number of States
14	7
15	12
16	27
17	2
18	2

85.

Q. If a state is chosen at random, what is the probability that the minimum age for obtaining a driver's license in that state will be at least 16?

A. $\frac{1}{25}$

B. $\frac{2}{25}$

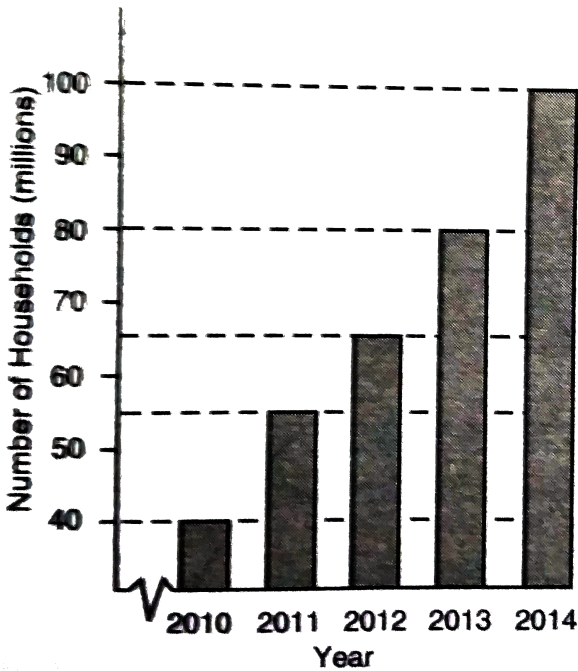
C. $\frac{19}{50}$

D. $\frac{31}{50}$

Answer: D



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86.

The graph above shows the number of U.S. households with laptop computers for the years

2010 to 2014.

Q. What was the percent of increase in the number of households with laptops from 2010 to 2014?

A. 40 %

B. 60 %

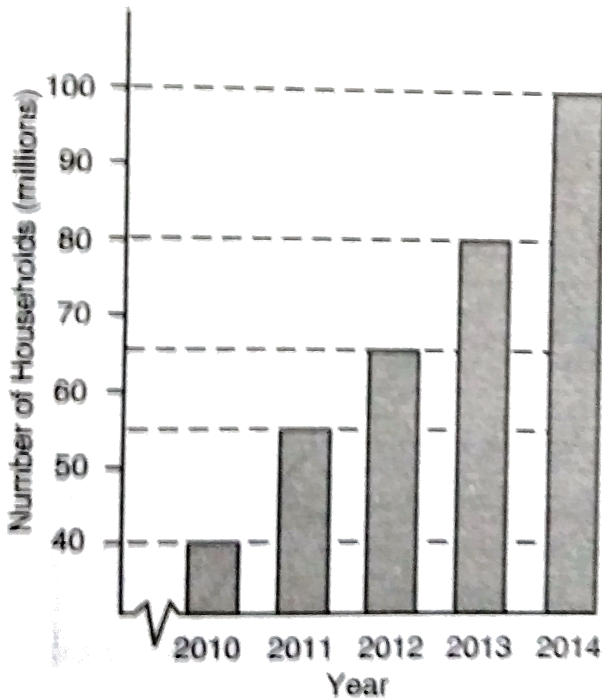
C. 120 %

D. 150 %

Answer: D



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87.

The graph above shows the number of U.S. households with laptop computers for the years 2010 to 2014.

Q. The greatest percent of increase in the number of households with laptops occurred in which two consecutive years?

A. 2010 to 2011

B. 2011 to 2012

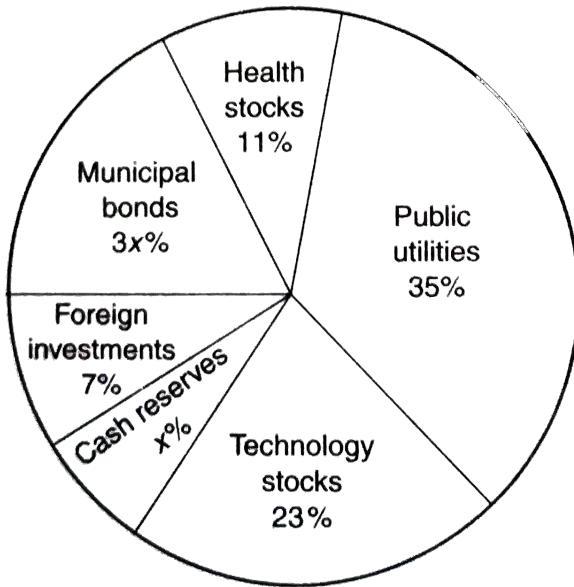
C. 2012 to 2013

D. 2013 to 2014

Answer: A



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88.

The graph above graphs how \$250,000 is invested.

Q. How much money is invested in municipal bonds?

A. \$45, 000

B. \$37, 000

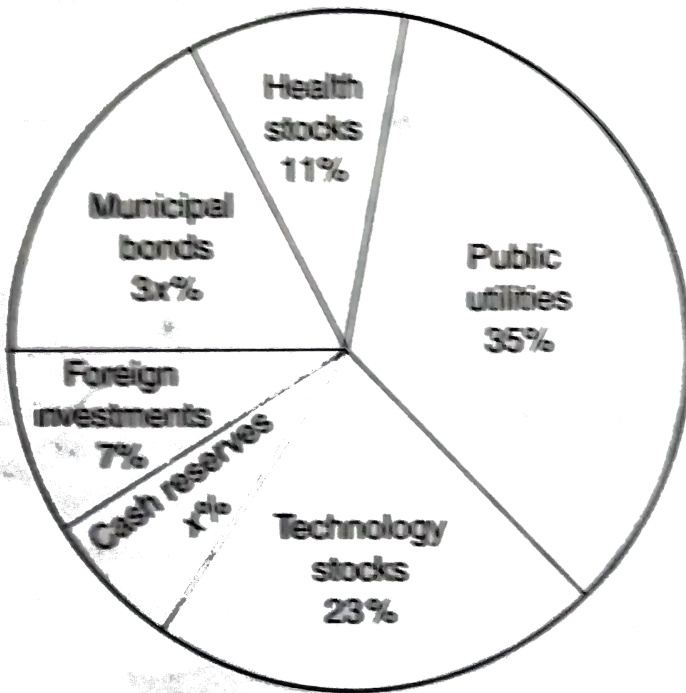
C. \$35,000

D. \$30,000

Answer: A



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89.

The graph above graphs how \$250,000 is invested.

Q. After 20% of the amount that is invested in technology stocks is reinvested in health stocks, how much money is invested in health stocks?

A. \$77, 500

B. \$65, 000

C. \$45, 000

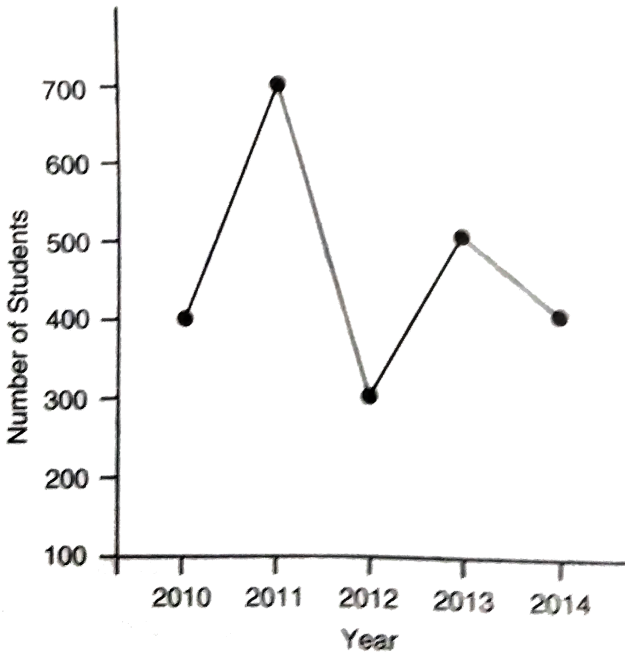
D. \$39, 000

Answer: D



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**Number of Students Enrolled
in Advanced Mathematics Courses**



90.

Q. The percent increase in the number of students enrolled in advanced mathematics courses from 2010 to 2011 exceeded the percent increase from 2012 to 2013 by approximately what percent?

A. 133

B. 75

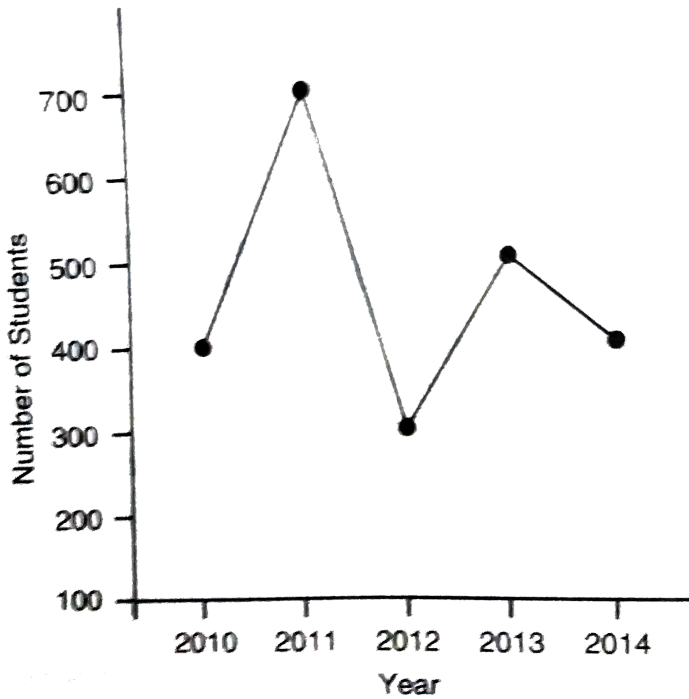
C. 67

D. 8

Answer: D



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91.

Q. From 2014 to 2015 the number of students enrolled in advanced mathematics courses increased by the same percent that student enrollment in advanced mathematics courses dropped from 2013 to 2014. What was the

approximate number of students enrolled in advanced mathematics courses in 2015?

A. 420

B. 440

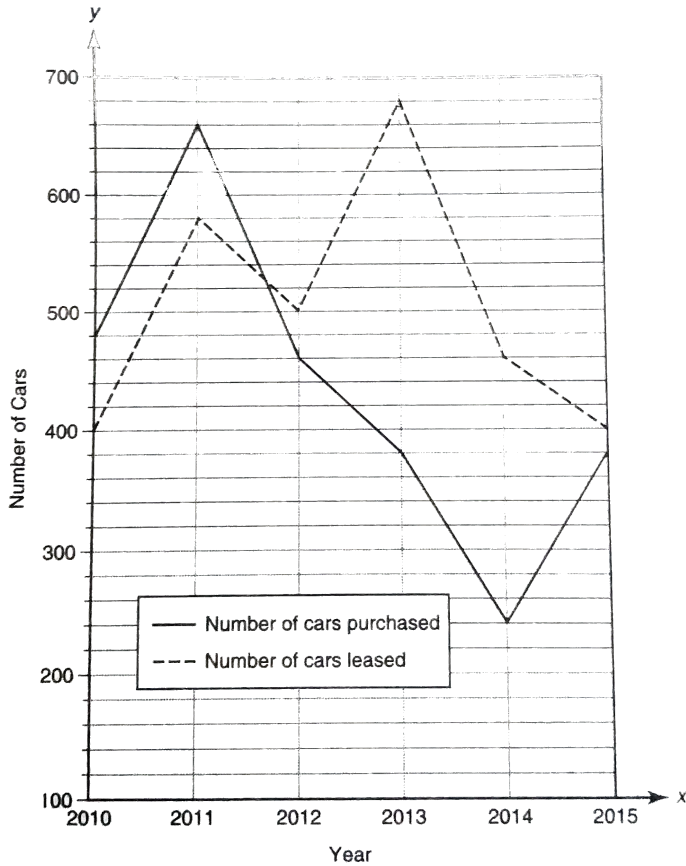
C. 450

D. 480

Answer: D



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92.

Q. In 2012, the number of cars purchased was x percent of the number of cars leased. What is the best approximation for x ?

A. 75

B. 80

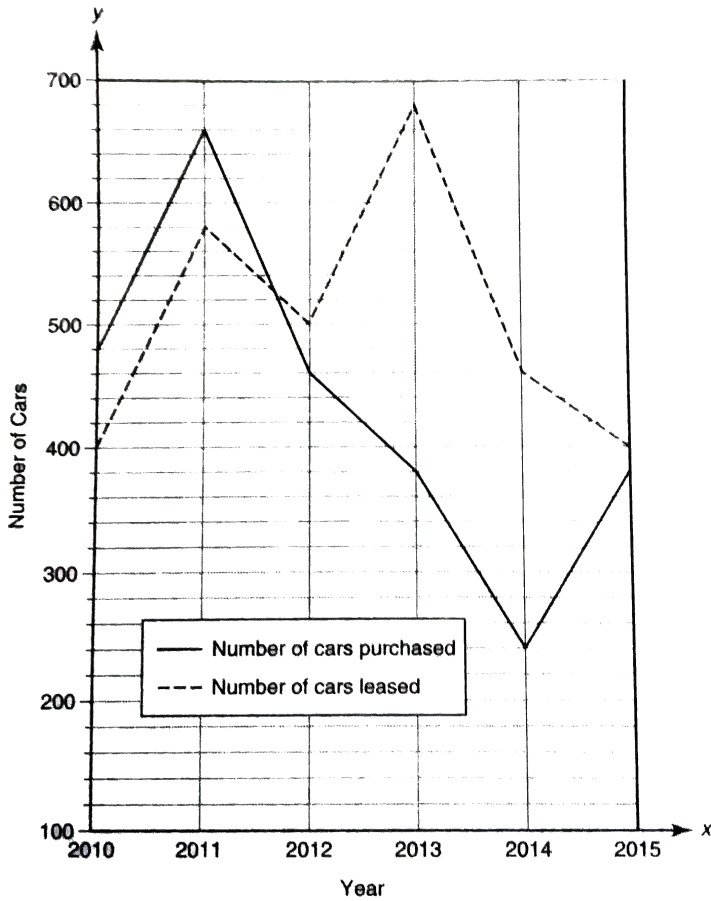
C. 85

D. 90

Answer: D



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93.

Question 11 and 12 refer to the graph above.

Q. Which of the following is the best approximation for the decrease in the number

of cars purchased per year between 2011 and 2014?

A. 105

B. 140

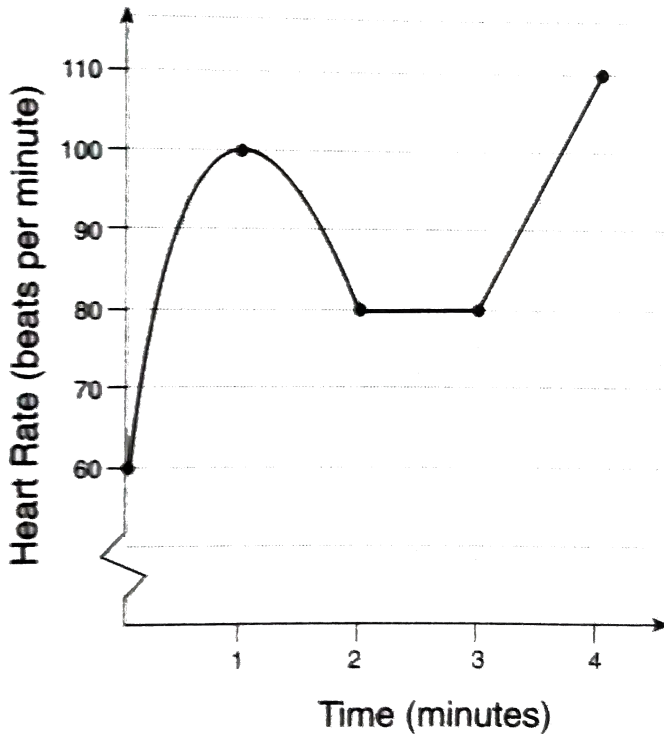
C. 300

D. 420

Answer: B



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94.

Question 13 and 14 refer to the graph above which shows the heart rate, in beats per minutes, of a jogger during a 4-minute interval.

Q. Over what interval of time, in minutes, was

the jogger's heart rate changing at a constant rate?

A. 0 to 1

B. 1 to 2

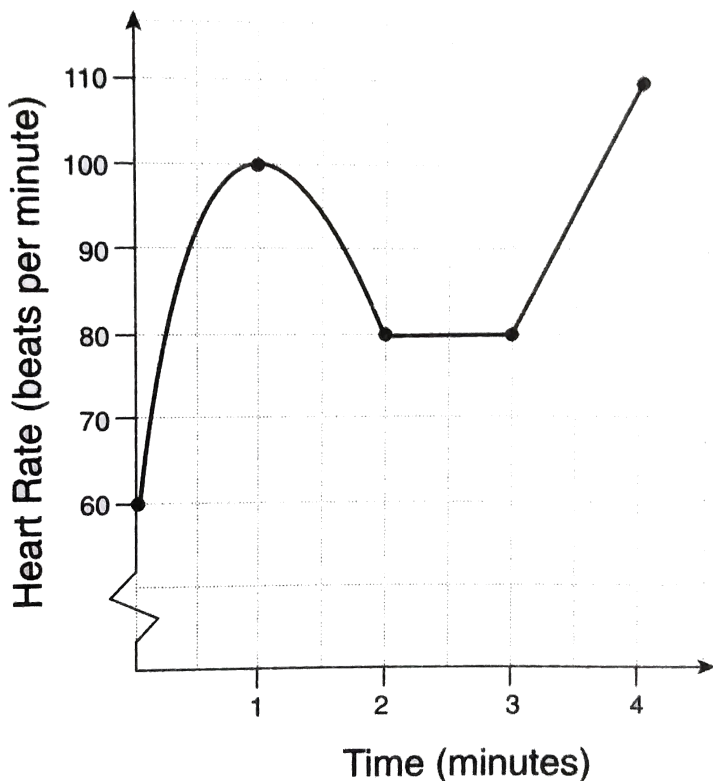
C. 2 to 3

D. 3 to 4

Answer: D



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95.

Question 13 and 14 refer to the graph above which shows the heart rate, in veats per minutes, of a jogger during a 4-minutes interval.

Q. The greatest percent of increase in the

jogger's heart rate occurred over what interval of time, in minutes?

A. 0 to 1

B. 1 to 2

C. 2 to 3

D. 3 to 4

Answer: A



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HEAD CIRCUMFERENCE GROWTH SPEED	
Age	Growth of Head Circumference (in centimeters)
First year	Circumference = $\frac{\text{Height} + 12}{2}$
1 to 3 years	1 centimeter every 6 months
3 to 5 years	1 centimeter every year

96.

The table above can be used to approximate the circumference of the head, in centimeters, during the first 5 years after birth. At 5 years of age, Jacob's head circumference was 81 cm. Based on the table, what was his approximate height, in centimeters, at 1 year old?

A. 138

B. 145

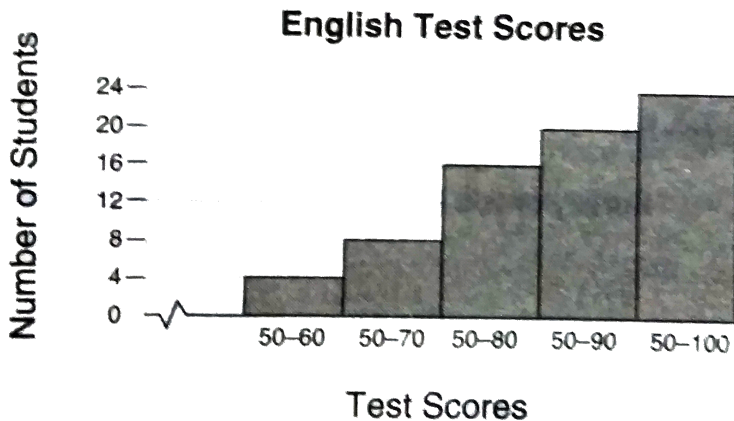
C. 152

D. 157

Answer: A



View Text Solution



97.

The cumulative histogram above shows the distribution of scores that 24 students received on an English test. If a student is selected at random, what is the probability that the student will have a score between 71 and 80?

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{1}{2}$

D. $\frac{2}{3}$

Answer: B



Watch Video Solution

	Tennis Team		
Gender	Juniors	Seniors	Total
Male	14	11	25
Female	5	10	15
Total	19	21	40

98.

The table above shows the composition of a coed high school tennis team with a total of 40

members. A player who will be selected at random from the team will be selected at random from the team will be given two free tickets will be given to either a female junior player or a male senior player?

A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. $\frac{2}{5}$

D. $\frac{1}{2}$

Answer: C



View Text Solution

99. Which survey is most likely to have the least bias?

A. Surveying a sample of people leaving a movie theater to determine which flavor of ice cream is the most popular.

B. surveying the members of a football team to determine the most watched TV sport

C. surveying a sample of people leaving a library to determine the average number

of books a person reads in a year

D. surveying a sample of people leaving a gym to determine the average number of hours a person exercise per week

Answer: A



Watch Video Solution

100. Erica is conducting a survey about the proposed increase in the sports budget in the

Hometown School District. Which survey method would likely contain the most bias?

A. Erica asks every third person entering the

Hometown Grocery Store

B. Erica asks every third person leaving the

Hometown Shopping Mall this weekend

C. Erica asks every fifth student entering

Hometown High School on Monday

morning

D. Erica asks fifth person leaving Saturday's

Hometown High School football game

Answer: D



Watch Video Solution

Age Group	Number of Drivers
16–25	150
26–35	129
36–45	33
46–55	57
56–65	31

101.

The table above summarizes the number of people by age group who were included in a

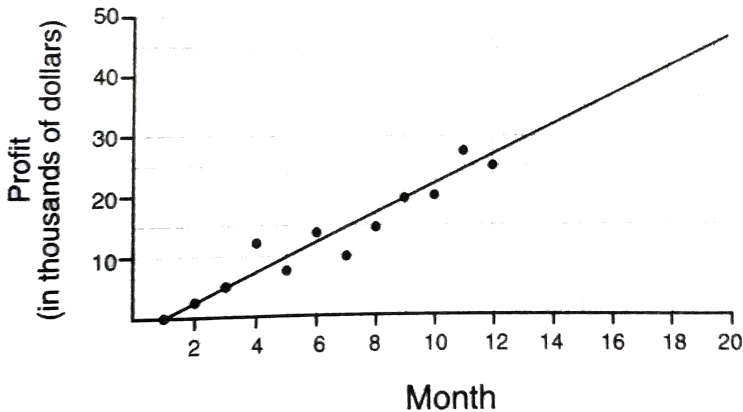
survey of driving habits. Which of the following statements is true?

- A. The survey was not biased since different age groups were included.
- B. The survey was biased because individuals 36 and older were underrepresented.
- C. The survey was biased because it did not differentiate between males and females
- D. The survey was not biased since a large number of drivers were polled.

Answer: B



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102.

The scatterplot above shows the profit, by month, for a new company for the first year of operation. A line of best fit is also shown. Using this line, by what dollar amount did the profit in

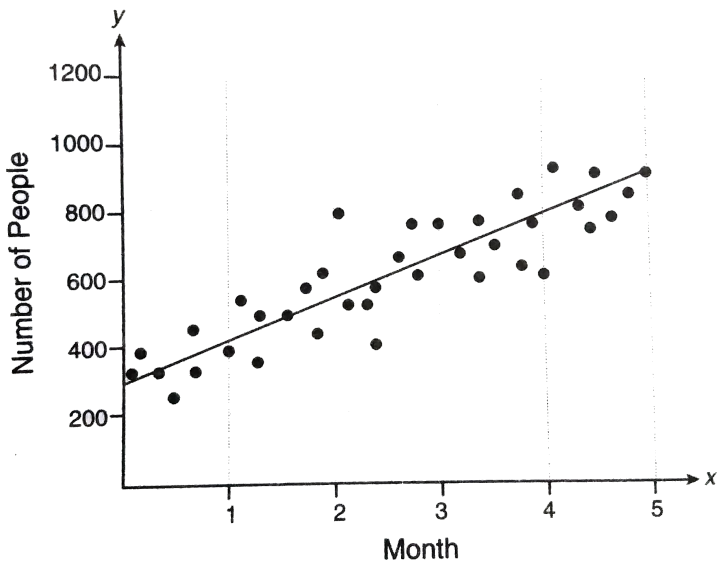
the 8th month exceed the profit in the 13th month?

- A. \$5, 000
- B. \$7, 750
- C. \$12, 500
- D. \$15, 000

Answer: C



Watch Video Solution



103.

A new fitness class was started at several fitness clubs owned by the same company. The scatterplot shows the total number of people attending the class during the first five months in which the class was offered. The line of best fit is drawn.

Q. For month 4, the predicted number of people

attending the class was approximately what percent greater than the actual number of people attending the class?

A. 15 %

B. 20 %

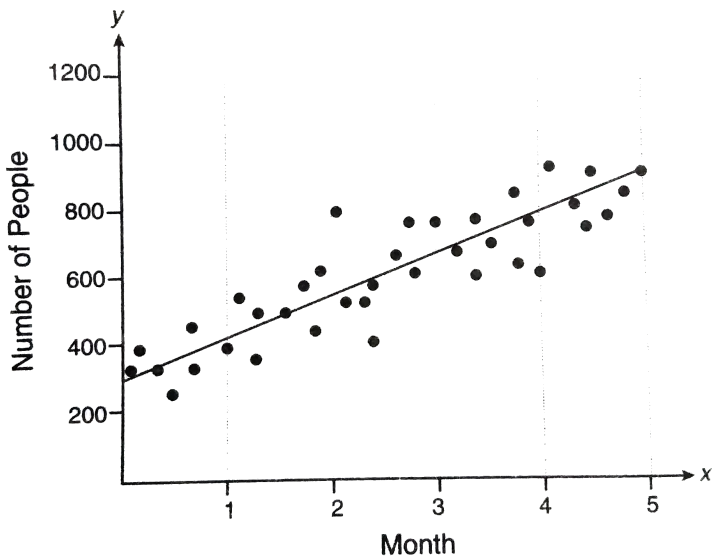
C. 30 %

D. 36 %

Answer: C



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104.

A new fitness class was started at several fitness clubs owned by the same company. The scatterplot shows the total number of people attending the class during the first five months in which the class was offered. The line of best fit is drawn.

Q. During the five-month period, the average

increase in the number of people attending the class per month is closest to which of the following?

A. 80

B. 100

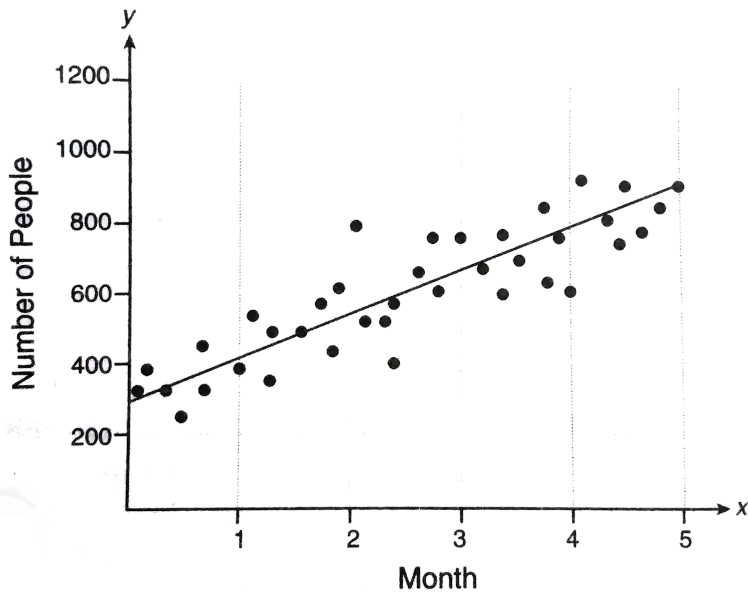
C. 120

D. 140

Answer: C



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105.

Question 5-7 refer to the scatterplot above.

A new fitness class was started at several fitness clubs owned by the same company. The scatterplot shows the total number of people attending the class during the first five months in which the class was offered. The line of best fit is drawn.

Q. At the beginning of which month did the actual number of people attending the class differ by the greatest amount from the number predicted by the line of best fit?

A. Month 2

B. Month 3

C. Month 4

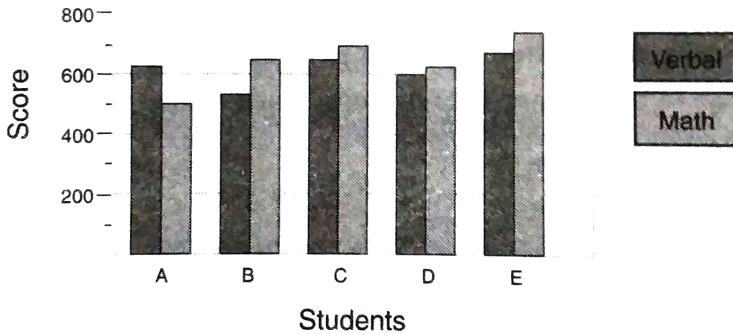
D. Month 5

Answer: A



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Comparing Verbal and Math SAT Scores



106.

The bar graph above shows the verbal and math SAT scores for five students labeled A through E. If a scatterplot of the data in the bar graph is made such that the math SAT score for each student is plotted along the x-axis and their verbal SAT score is plotted along the y-axis, how

many of the data points would lie above the line

$$y=x?$$

A. 1

B. 2

C. 3

D. 4

Answer: A



Watch Video Solution

107. The average (arithmetic mean) of a set of seven numbers is 81. If one of the numbers is discarded, the average of the remaining number is 78. What is the value of the number that was discarded?

A. 98

B. 99

C. 100

D. 101

Answer: B



108. the arithmetic mean of a set of 20 test scores is represented by x . If each scores is increased by y points, which expression represents the arithmetic mean of the revised set of test scores?

A. $x + y$

B. $x + 20y$

C. $x + \frac{y}{20}$

D. $\frac{x + y}{20}$

Answer: A



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109. What is the area of the circle whose radius is the average of the radii of two circles with areas of 16π and 100π ?

A. 25π

B. 36π

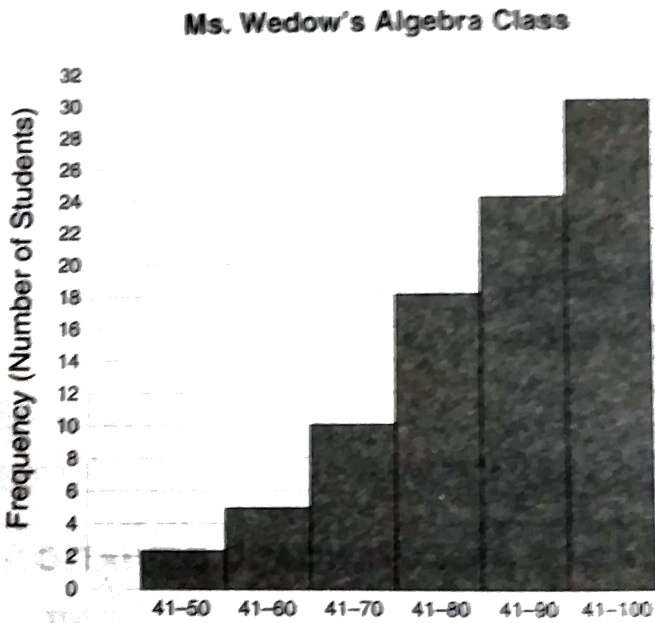
C. 49π

D. 64π

Answer: C



Watch Video Solution



110.

The diagram above shows a graph of the student's test scores in Ms. Wedow's algebra

class. Which ten-point interval contains the median?

A. 61 – 70

B. 71 – 80

C. 81 – 90

D. 91 – 100

Answer: B



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111. If k is a positive integer, which of the following represents the average of 3^k and 3^{k+2} ?

A. $\frac{1}{2} \cdot 3^{k+1}$

B. $5 \cdot 3^k$

C. $6^{\frac{3}{2}k}$

D. $\frac{1}{2} \cdot 3^{3k}$

Answer: B



Watch Video Solution

112. When x is subtracted from $2y$, the difference is equal to the average of x and y . What is the value of $\frac{x}{y}$?

A. $\frac{1}{2}$

B. $\frac{2}{3}$

C. 1

D. $\frac{3}{2}$

Answer: C



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113. If the average of x , y , and z is 32 and the average of y and z is 27. What is the average of x and $2x$?

A. 42

B. 45

C. 48

D. 63

Answer: D



Watch Video Solution

Company 1

Worker's Age in Years	Salary in Dollars
25	30,000
27	32,000
28	35,000
33	38,000

Company 2

Worker's Age in Years	Salary in Dollars
25	29,000
28	35,500
29	37,000
31	65,000

114.

Which of the following statements is true about the data in the tables above?

I. The mean salaries for both companies are greater than \$35,000.

II. The mean age of workers in Company 1 is greater than the mean age of workers in Company 2.

III. The salary range in Company 2 is greater than the salary range in Company 1.

A. I only

B. III only

C. I and II only

D. II and III only

Answer: B



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115. A man drove a car at an average rate of speed of 45 miles per hour for the first 3 hours of a 7-hour car trip. If the average rate speed for the entire trip was 53 miles per hour, what was the average rate of speed in miles per hour for the remaining part of the trip?

A. 50

B. 55

C. 57

D. 59

Answer: D



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116. In a set of n data values, m represents the median. If each number in the set is decreased by 3, which expression represents the median of the revised set of data values?

A. m

B. $m-3$

C. $m - \frac{3}{n}$

D. $\frac{m - 3}{n}$

Answer: B



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117. Susan received grades of 78, 93, 82, and 76 on four math exams. What is the lowest score she can receive on her next math exam and have an average of at least 85 on the five exams?

A. 96

B. 94

C. 92

D. 90

Answer: A



Watch Video Solution

118. What is the average of $(x + y)^2$ and $(x - y)^2$?

A. $\frac{x + y}{2}$

B. xy

C. $x^2 - y^2$

D. $x^2 + y^2$

Answer: D



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119. The average of the test scores of a group of x students is 76 and the average of the test scores of a group of y students is 90. When the scores of the two groups of students are

combined, the average test score is 85. What is

the value of $\frac{x}{y}$?

A. $\frac{4}{7}$

B. $\frac{5}{9}$

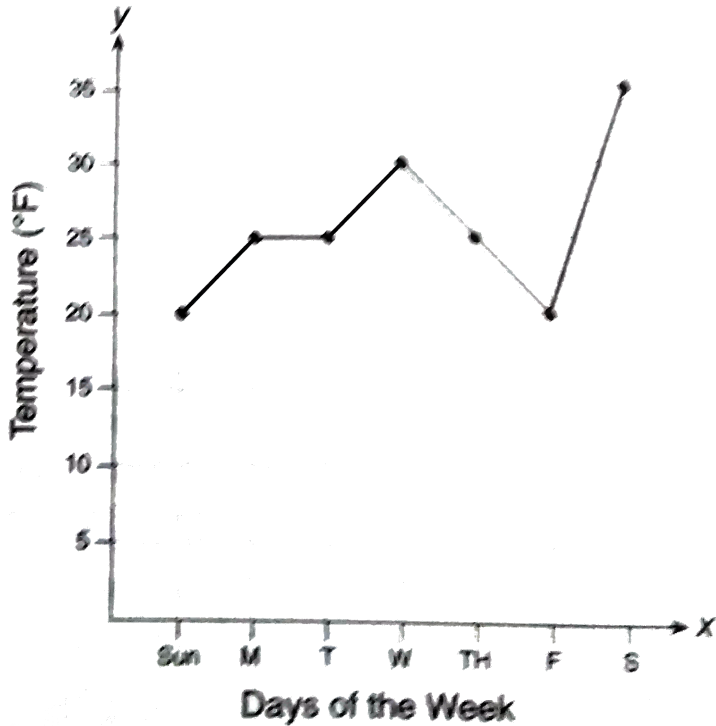
C. $\frac{2}{3}$

D. $\frac{7}{4}$

Answer: B



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120.

The graph above shows the average daily temperature during a particular week in January in certain city. Which statement best describes the temperature data in the graph above?

A. Median=mean

B. meas $<$ mode

C. median =mode

D. mean=mode

Answer: C



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121. The average of a , b , c , d , and e is 28. If the average of a , c , and e is 24, what is the average of b and d ?

A. 31

B. 32

C. 33

D. 34

Answer: D



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122. If $2a + b = 7$ and $b + 2c = 23$, what is the average of a , b , and c ?

A. 5

B. 7.5

C. 15

D. 12.25

Answer: A



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Minutes	14	15	16	17	18	19	20
Number of Students	5	3	x	5	2	10	1

123.

The number of minutes students took to complete a quiz is summarized in the table

above. If the mean number of minutes was 17, which equation could be used to calculate c ?

A. $17 = \frac{119 + x}{x}$

B. $17 = \frac{119 + 16x}{x}$

C. $17 = \frac{446 + x}{26 + x}$

D. $17 = \frac{446 + 16x}{26 + x}$

Answer: D



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124. The average of a , b , c , and d is p . If the average of a and c is q , what is the average of b and d in terms of p and q ?

A. $2p + q$

B. $2p - q$

C. $2q + q$

D. $2q - p$

Answer: B



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125. The lowest value in a set of ordered scores is x and the highest value is y . If each score is increased by k , then which of the following must be true of the revised set of scores?

I. The mean is increased by k .

II. The range is k .

III. The median remains unchanged.

A. I only

B. II only

C. I and III only

D. II and III only

Answer: A



Watch Video Solution

Class X

Grade	Frequency
A	4
B	11
C	3
D	2
F	1

Class Y

Grade	Frequency
A	6
B	4
C	2
D	6
F	3

126.

The tables give the distribution of grades for 21 students in two different college mathematics classes. For purposes of making statistical calculations,

$A = 4, B = 3, C = 2, D = 1,$ and $F = 0.$

Which of the following statements is true about the data shown for these two classes?

I. The standard deviation of grades is greater for class X.

II. the standard deviation of grades is greater for class Y.

III. The median letter grade is the same for classes X and Y.

A. I only

B. II only

C. I and III only

D. II and III only

Answer: B



View Text Solution

Player's Annual Salaries (millions of dollars)					
0.5	0.5	0.6	0.7	0.75	0.8
1.0	1.0	1.1	1.25	1.3	1.4
1.4	1.8	2.5	3.7	3.8	4
4.2	4.6	5.1	6	6.3	7.2

127.

21-22 The table above shows the annual salaries for the 24 members of a professional sports team in terms of millions of dollars.

Q. If each player's salary is increased by 10% which of the following statistics does not increase by 10%?

A. Median

B. Mean

C. Mode

D. all increase by 10%

Answer: D



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Player's Annual Salaries (millions of dollars)					
0.5	0.5	0.6	0.7	0.75	0.8
1.0	1.0	1.1	1.25	1.3	1.4
1.4	1.8	2.5	3.7	3.8	4
4.2	4.6	5.1	6	6.3	7.2

128.

21-22 The table above shows the annual salaries for the 24 members of a professional sports team in terms of millions of dollars.

Q.The team signs an additional player to a contract with an annual salary of 7.5 million dollars per year, which brings the sum of the salaries of the 25 players to 69 million dollars. By what amount, in dollars, does the mean increase?

A. 197, 500

B. 256, 250

C. 300, 000

D. It cannot be determined.

Answer: A



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Grib In

1. A store offers a 4% discount if a consumer pays cash rather than paying by credit card. If the cash price of an item is \$84.00, what is the credit card purchase price of the same item?



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2. During course registration, 28 students enroll in a certain college class. After three boys are dropped from the class, 44% of the class consists of boys. What percent of the original class did girls comprise?



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3. A high school tennis team is scheduled to play 28 matches. If the team wins 60% of the first 15 matches, how many additional matches must the team win in order to finish the season winning 75% of its scheduled matches?



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4. In a club of 35 boys and 28 girls, 80% of the boys and 25% of the girls have been members

for more than 2 years. If n percent of the club have been members for more than 2 years, what is the value of n ?



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5. A string is cut into 2 pieces that have lengths in the ratio of 2:9. If the difference between the lengths of the 2 pieces of string is 42 inches, what is the lengths in inches of the shorter pieces?



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6. For integer values of a and b , $b^a = 8$. The ratio of a to b is equivalent to the ratio of c to d , where c and d are integers. What is the value of c when $d=10$?

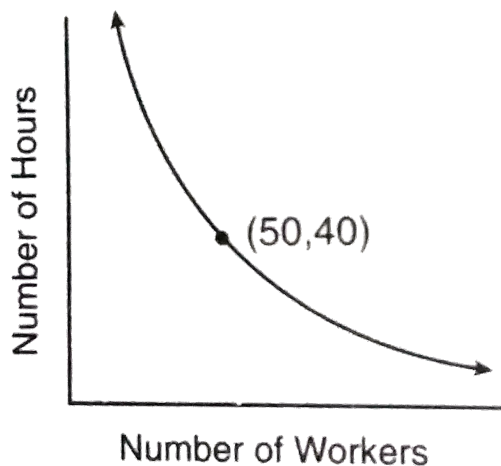


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7. Jars A, B, and C each contains 8 marbles. What is the minimum number of marbles that must be transferred among the jars so that the ratio of the number of marbles in jar A to the number in jar B to the number in jar C is 1:2:3?



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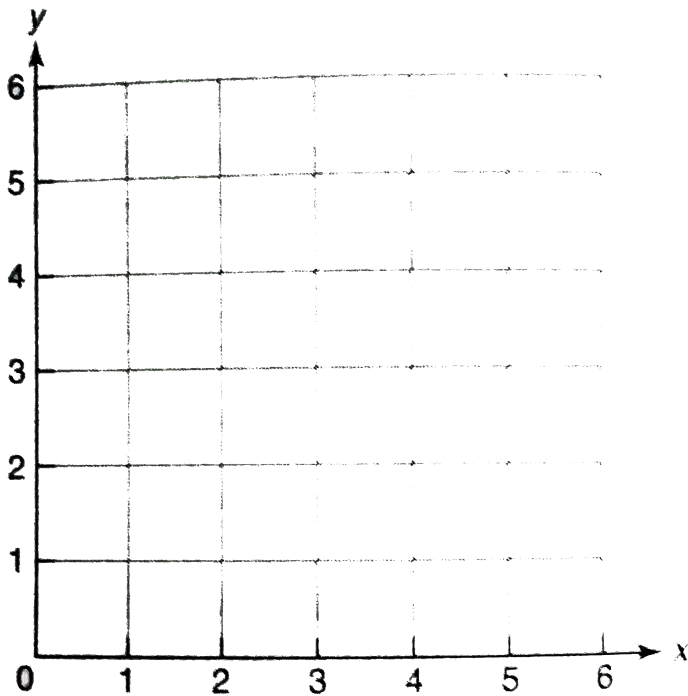
8.

A political campaign organizer has determined that the number of hours needed to get out a mailing for her candidate is inversely related to the number of campaign workers she has. If she uses the information in the accompanying

graph, how many hours would it take to do the mailing if 125 workers are used?



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9.

A square dartboard is placed in the first

quadrant from $x=0$ to 6 and $y=0$ to 6, as shown in the accompanying figure. A triangular region on the dartboard is enclosed by the graphs of the equations $y = 2$, $x = 6$, and $y = x$ (not shown). Find the probability that a dart that randomly hits the dartboard will land in the triangular region formed by the three lines,



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10. Fruit for a dessert costs \$1.20 a pound. If 5 pounds of fruit are needed to make a dessert that serves 18 people, what is the cost of the

fruit needed to make enough of the same dessert to serve 24 people?



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11. A printing press produces 4,600 flyers per hour. At this rate, in how many minutes can the same printing press produce 920 flyers?



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12. FOREIGN CURRENCY CONVERSIONS

U.S. Dollar to British Pound =1.56 to 1

British Pound to Euro=1 to 1.38

Foreign currency conversion rates for the British pound, U.S. dollar, and Euro are listed above. What would be the cost in U.S. dollars for a shirt that has a purchase price of 46 Euros, correct to the nearest dollars?



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13. Joseph typed a 1,200-word essay in 25 minutes with an average of 240 words on a page. At this rate, how many 240-word pages can he type in 1 hour?



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14. At a party, six 1-liter bottles of soda are completely emptied into 8-ounce cups. What is the least number of cups that are needed? [There are approximately 1.1 quarts in 1 liter.]



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15. On a certain map, 1 inch represents 2 kilometers. A region is located on the map that is 1.5 inches by 4.0 inches. What is the actual area of the region in square miles if 1 kilometer is equal to 0.6 mile?



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16. the distance from Earth to Mars is 136,000,000 miles. A spacecraft travels at an average speed of 28,500 kilometers per hour.

Determine, to the nearest day, how long it will take the spacecraft to reach Mars. [1 kilometer=0.6 miles]



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17. A certain generator will run for 1.5 miles on one liter of gas. If the gas tank has the shape of a rectangular box that is 25 cm by 20 cm by 16 cm, how long will the generator run on a full tank of gas? [1 liter= 1,000 cubic centimeters]



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18. One knot is one nautical mile per hour, and one nautical mil is 6,080 feet. If a cruiser ship has an average speed of 3.5 knots, how many feet does the ship travel in 24 minutes?



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19. Jacod begins painting at 12:00 noon. At 12:30 P.M. he estimate that 13 gallons of paint are left, and at 3:30 he estimates that 4 gallons of paint remains. If the paint is being used at a constant

rate, how many gallons of paint did Jacod have when he started the job?



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20. The number of hours, H , needed to manufacture X computer monitors is given by the function $H = kX + q$, where k and q are constants. If it takes 270 hours to manufacture 100 computer monitors and 410 hours to manufacture 160 computer monitors, how many minutes are required to manufacture each additional computer monitor?



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21. Given a starting population of 100 bacteria, the formula $b(t) = 100(2^t)$ can be used to determine the number of bacteria, b , after t periods of time. If each time period is 15 minutes long, how many minutes will it take for the population of bacteria to reach 51,200?



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22. A certain drug raises a patient's heart rate, h , in beats per minute, according to the equation $h(x) = 65 + 0.2x$, where x is the number of milligrams of the drug in the patient's bloodstream. After t hours, the level of the drug in the patient's bloodstream decrease exponentially according to the equation $x(t) = 512(0.7)^t$. After 5 hours, what is the number of beats per minute in the patient's heart rate, correct to the nearest whole number?



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23. The breakdown of sample of chemical compound is represented by the function $p(t) = 300\left(\frac{1}{2}\right)^t$, where $p(t)$ represents the number of milligrams of the substance, and t represents the time, in years. If $t = 0$ represents the year 2015, what will be the first year in which the amount of the substance remaining falls to less than 5 milligrams?

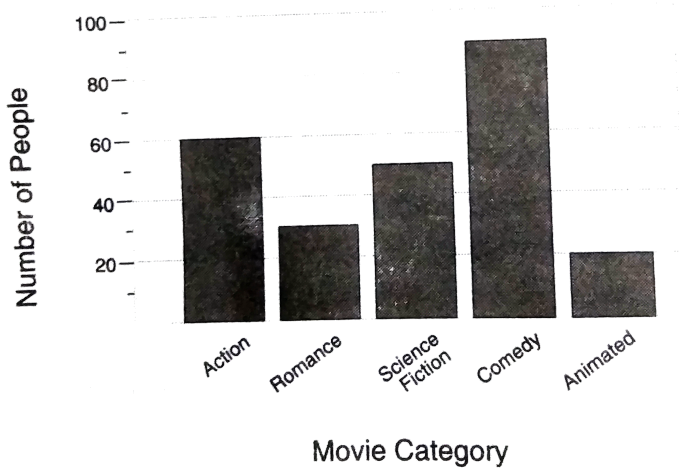


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24. Sasha invested \$1,200 in a savings account at an annual interest rate of 1.6% compounded annually. She made no further deposits or withdrawals. To the nearest dollar, how much more money did she have in the account after 3 years than after 2 years?



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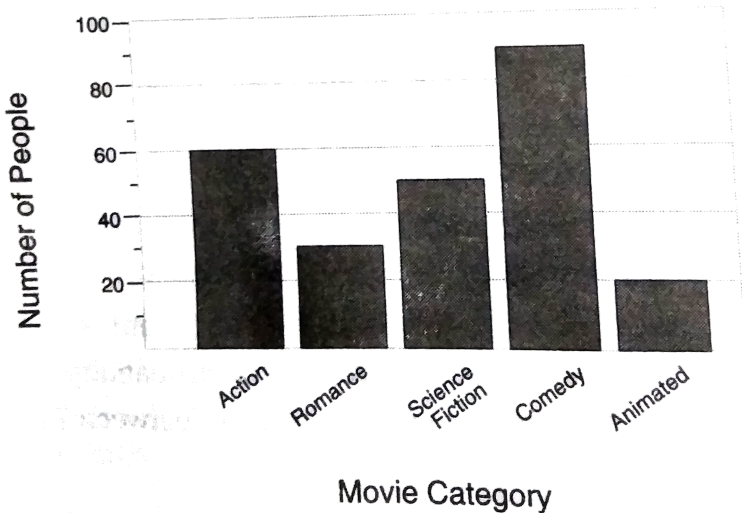


25.

the graph above that summarizes a survey of a group of 250 people who were randomly selected when leaving a multiplex movie theater and asked what type of movie they had seen.

Q. The percent of the people surveyed saw either an action or a science fiction movie?





26.

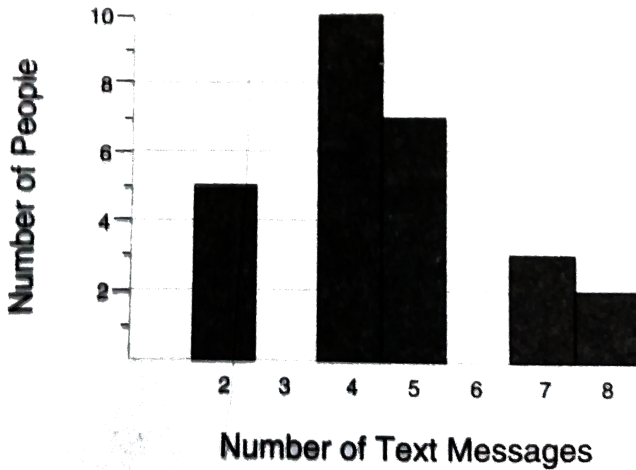
Question 1 and 2 refer to the graph above that summarizes a survey of a group of 250 people who were randomly selected when leaving a multiplex movie theater and asked what type of movie they had seen.

Q. If a total of 1,700 tickets were sold for the five

types movies represented in the histogram, what is the best estimate for the number of tickets sold to the Ramance movie?



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27.

The histogram above shows the number of mobile text message sent by a randomly

selected group of 27 people on a given day. The average number of text message sent per person is closest to what whole number?



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Grade	1 Club	2 Clubs	3 or More Clubs	Total
9th	37	43	18	98
10th	48	38	22	108
11th	52	27	31	110
12th	75	30	29	134
Total	212	138	100	450

28.

Question 4-6 refer to the above table, which summarizes the result of a survey of the student body of a high school about club

membership in which each student enrolled in the high school enumerated the clubs in which they were members.

Q. If a student is selected at random, what is the probability that the student does not belong to 3 or more clubs?



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Grade	1 Club	2 Clubs	3 or More Clubs	Total
9th	37	43	18	98
10th	48	38	22	108
11th	52	27	31	110
12th	75	30	29	134
Total	212	138	100	450

29.

Question 4-6 refer to the above table, which summarizes the result of a survey of the student body of a high school about club membership in which each student enrolled in the high school enumerated the clubs in which they were members.

Q. If 28% of the students who are enrolled in this school belong to at least two clubs, how

many students who are enrolled in this school did not participate in the survey?



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Grade	1 Club	2 Clubs	3 or More Clubs	Total
9th	37	43	18	98
10th	48	38	22	108
11th	52	27	31	110
12th	75	30	29	134
Total	212	138	100	450

30.

Question 4-6 refer to the above table, which summarizes the result of a survey of the student body of a high school about club

membership in which each student enrolled in the high school enumerated the clubs in which they were members.

Q. If a student is selected at random, what is the probability that the student is either a 9th grade student or belongs to 3 or more clubs?



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Gender	Eye Color			Total
	Brown	Hazel	Blue	
Male		13		
Female		32		
Total	133			200

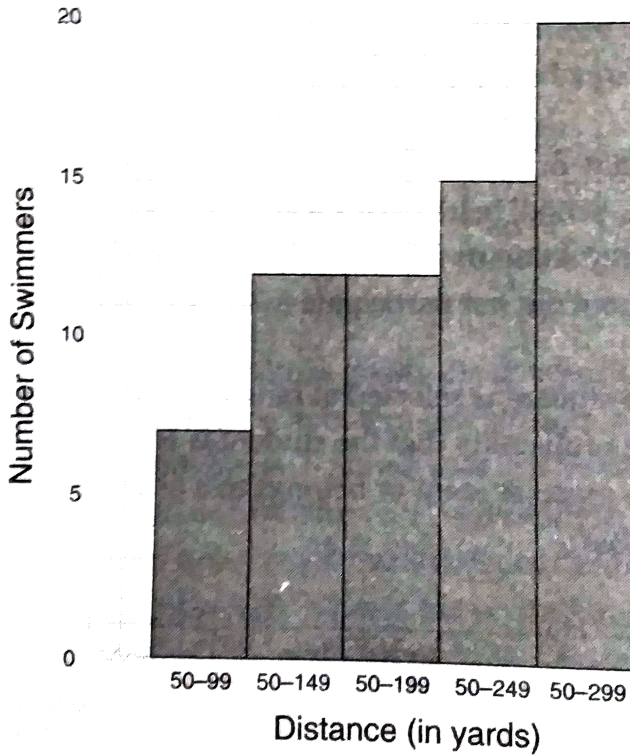
31.

The partially completed table above describes

the distribution of 200 subjects in a study involving eye color in which there were 4 times as many males with brown eyes as with blue eyes and 7 times as many females with brown eyes as with blue eyes. What percent of the students were either male with blue eyes or female with brown eyes?



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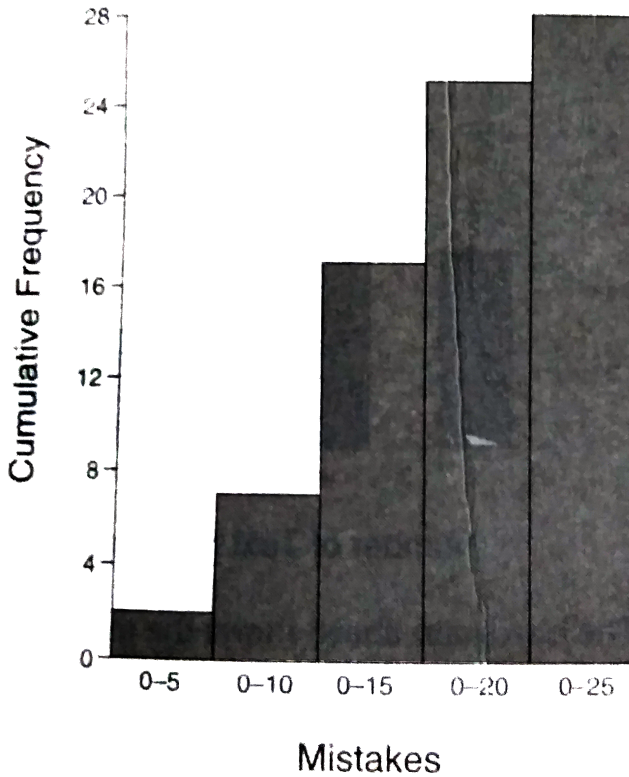
32.

Based on the cumulative histogram above, what percent of the total number of swimmers swam between 200 and 249 yards?



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Errors on French Test



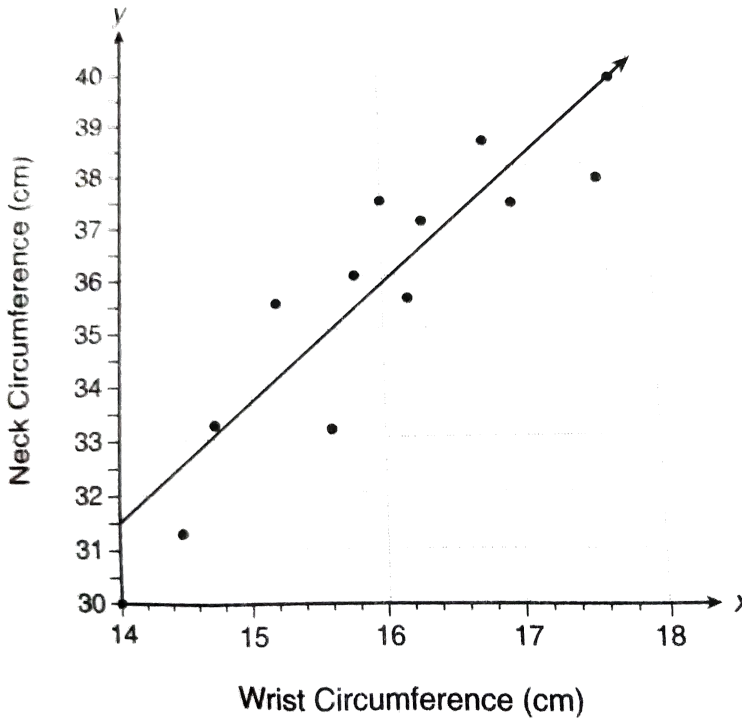
33.

The cumulative histogram above shows the distribution of mistakes 28 students in a French language class made on a test. What is the

probability that a student selected at random made more than 10 mistakes?



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34.

Question 1-3 refer to the above scatterplot,

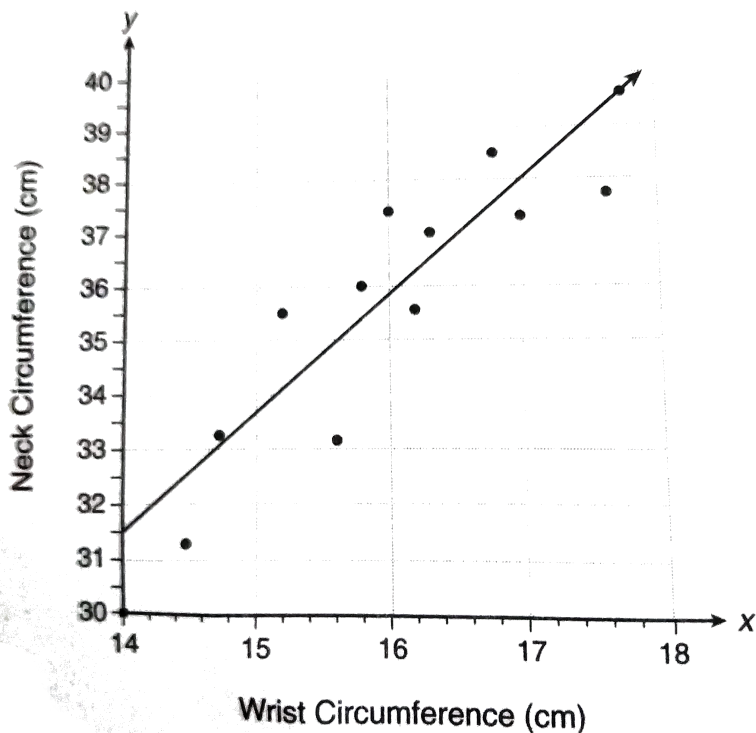
which shows wrist and neck circumference measurements, in centimeters, for 12 people.

The line of best fit is drawn.

Q. What is the predicted neck circumference in centimeters, for someone whose wrist circumference is 17.0 cm?



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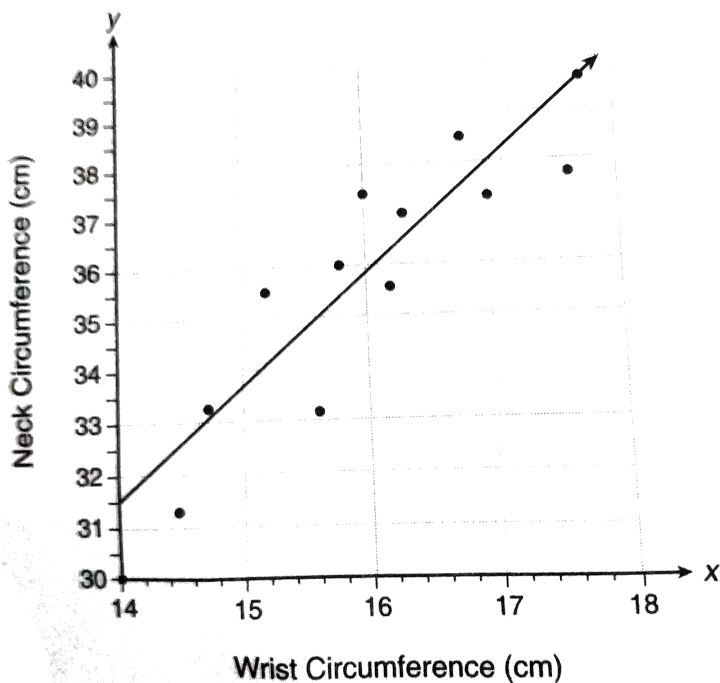
Question 1-3 refer to the above scatterplot, which shows wrist and neck circumference measurements, in centimeters, for 12 people. The line of best fit is drawn.

Q. How many of the 12 people have an actual neck circumference that differs by more than 1

centimeters from the neck circumference predicted by the line of best fit?



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36.

Question 1-3 refer to the above scatterplot,

which shows wrist and neck circumference measurements, in centimeters, for 12 people.

The line of best fit is drawn.

Q. What is the average increase in neck circumference per centimeter increase in wrist circumference, correct to the nearest tenth?



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37. The average of r and s is 7.5, and the average of r , s and t is 11. What is the value of t ?



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38. If the average of x , y , and z is 12, what is the average of $3x$, $3y$, and $3z$?



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39. In order to compensate for a difficult midterm exam, Danialle's mathematics teacher adjusted each of the 25 students' midterm exam scores by replacing it by one half of the original score increased by 50. If the mean of the revised set of midterm scores is 82, what was the mean of the original set of scores?



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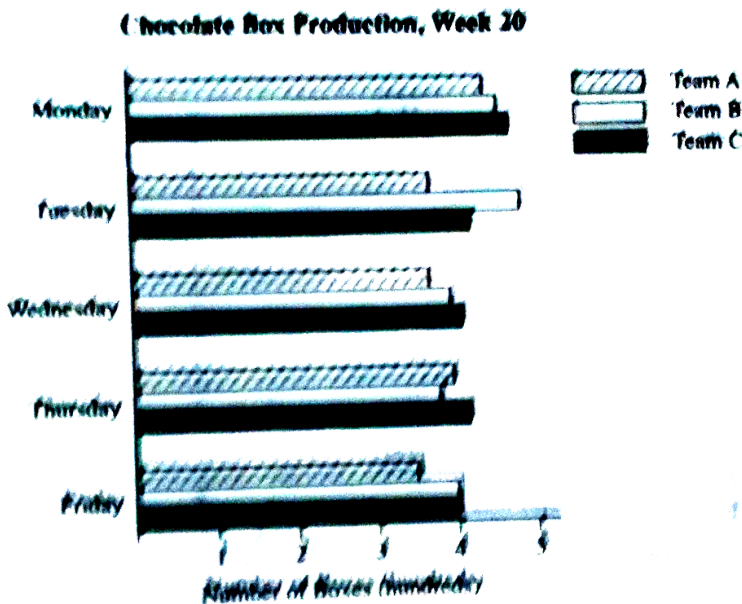
40. On a test that has normal distribution of scores, a score of 58 falls two standard deviation below the mean, and a score of 85 is one standard deviation above the mean. What is the mean score of this test?



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Practice Test

1. Maria is an assembly - line supervisor at a plant that packages boxes of chocolates. Each week Marie reviews the production rates for the three teams that work on her assembly line. According to the following bar graph , which team had the highest overall production for week 20 ?



A. Team A

B. Team B

C. Team C

D. Team A and Team B had the same high
production rate

Answer: C



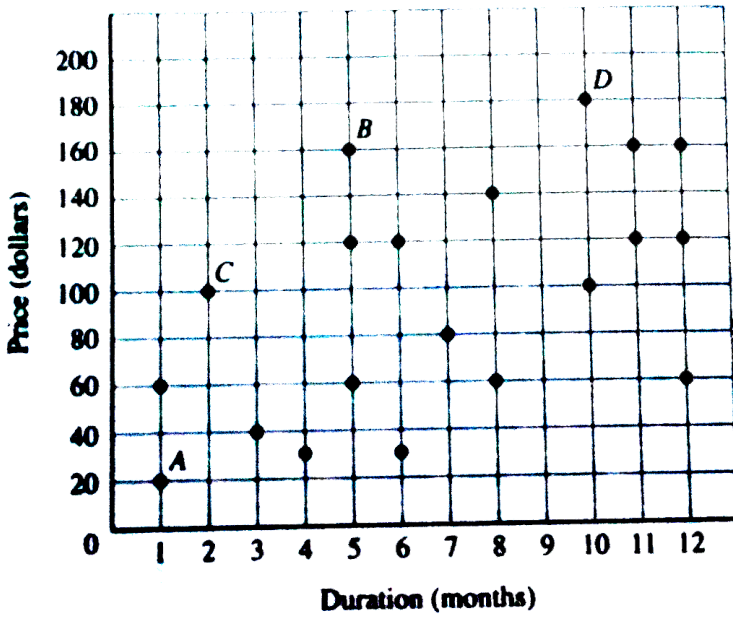
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2. The toe shoes of professional ballerinas often wear out in less than a year . At a ballet school

there are 20 students , all of whom bought new toe shoes of different brands and at varying prices. They kept track of how long their shoes lasted. Each point on the graph below shows the duration of a ballet student's toe shoes plotted against their price . Of the five labeled points , which one corresponds to the toe shoes that cost the greatest amount per month of use

?

Duration of Toe-Shoes Versus Cost



A. A

B. B

C. C

D. D

Answer: C



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3. The Math Team and Debate Club at Jackson City High School buy their T-shirts from different stores. The tables below show the numbers of T-shirts ordered by the Math Team and Debate Club , and the costs of medium , large , and extra-large T-shirts.

Numbers of T-shirts Ordered			
	Medium	Large	Extra-Large
Math Team	7	18	20
Debate Club	2	20	10

Costs of T-shirts		
	Math Team	Debate Club
Medium	\$11	\$9
Large	\$11	\$10
Extra-large	\$11	\$14

Which statement about the costs of T-shirts , as shown in the tables , is true ?

I.The Math Team spent more on extra-large T-shirts than the Debate Club spent .

II.On average , the Math Team paid more per T-shirt than the Debate Club paid .

III. Of the three sizes , extra-large T-shirts had the highest median cost.

A. I only

B. II only

C. III only

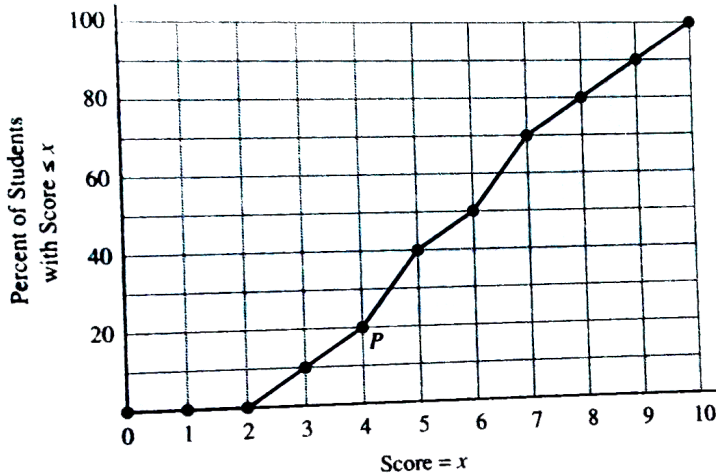
D. I,II and III

Answer: A



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Students and Test Scores



4.

When a 10-question true -false quiz was given to 50 students , the number of correct answer ranged from 3 to 10 , as shown on the graph above . Each point on the graph shows the percent of students who earned scores less than or equal to x . For example , point P shows that 20 percent of the students received scores

of 4 or less. According to the graph , how many students got scores of 6 ?

A. 5

B. 10

C. 15

D. 20

Answer: A



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5. In the sequence $x, x+d, x+2d, x+3d$, assume that x and d are positive integers . What is the difference between the arithmetic mean and the median of the numbers in the sequence ?

A. $2x + 3d$

B. $\frac{2x + 3d}{2}$

C. $\frac{x + d}{2}$

D. 0

Answer: D



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6. The table below gives the frequency with which various scores were obtained on a 20-question written section of a drivers education test .

Score	12	13	14	15	16	17	18	19	20
Frequency	2	3	0	3	3	5	5	6	4

The mode of the data is

A. 3

B. 6

C. 18

D. 19

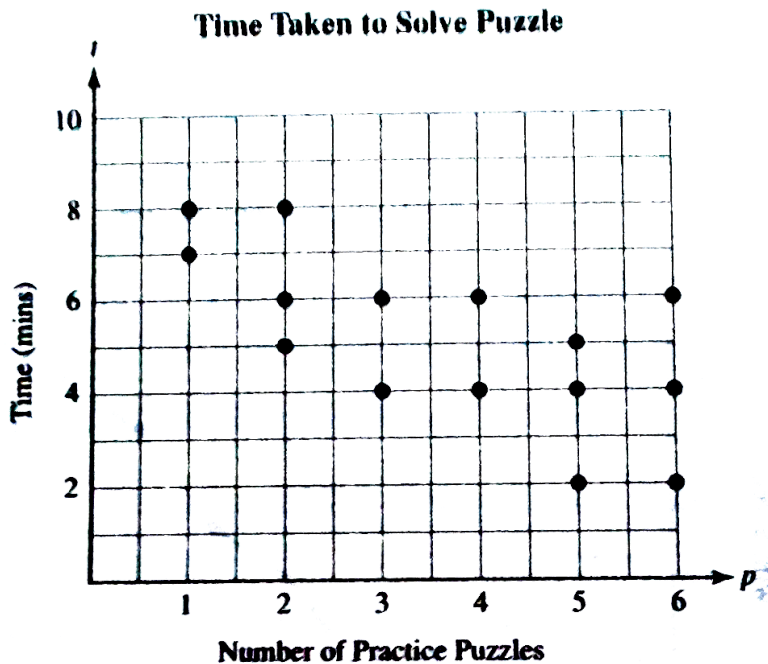
Answer: D



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7. A psychologist's experiment involved timing 15 small children as they found the solution to a little puzzle . Each child received at least one similar puzzle to play with before being timed . The scatterplot below shows the time each child took to solve the puzzle , and the corresponding number of "practice" puzzles

each child received . On the basis of these data ,
which of the following functions best models
the relationship between t , the number of
minutes taken to complete the puzzle , and p ,
the number of practice puzzles ?



A. $t(p)=9$

B. $t(p) = \frac{p}{2} + 9$

C. $t(p) = -\frac{p}{2} + 9$

D. $t(p) = -\frac{p}{2}$

Answer: B



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Population in Region R by Towns
♀ = 10,000 people



8.

If the four towns shown in the graph are the only towns in Region R, the combined populations of which two towns account for exactly 45 percent of the population of Region R?

A. A and B

B. B and C

C. A and C

D. A and D

Answer: B



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9. Ali is in a minivan with x children . Let y be the average (arithmetic mean) of the children's ages . If Ali's age is 6 times y , then her age is

what fraction of the total ages of all the people
in the minivan ?

A. $\frac{6}{6 + y}$

B. $\frac{6}{6 + x}$

C. $\frac{6}{x + y}$

D. $\frac{x}{6y}$

Answer: B



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Number of Pets	Frequency
6	2
5	1
4	3
3	5
2	8
1	14
0	7

10.

The number of pets owned by children in a sixth grade class are shown in the table above . What is the median of the data ?

A. 1

B. 2

C. 3

D. 5

Answer: A



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11. To commute to his office, Mr. Brown can take either the A train or B train. Both train stations are the same distance from his apartment, and both stations claim that on average they run 10 minutes late from the scheduled arrival time .

The standard deviation for the A train is 1 minute and for the B train is 5 minutes . Which of the following is a valid conclusion for Mr. Brown ?

A. If he regularly takes the A train, he will arrive at approximately the same time every day .

B. if he takes the A train , he is less likely to arrive late

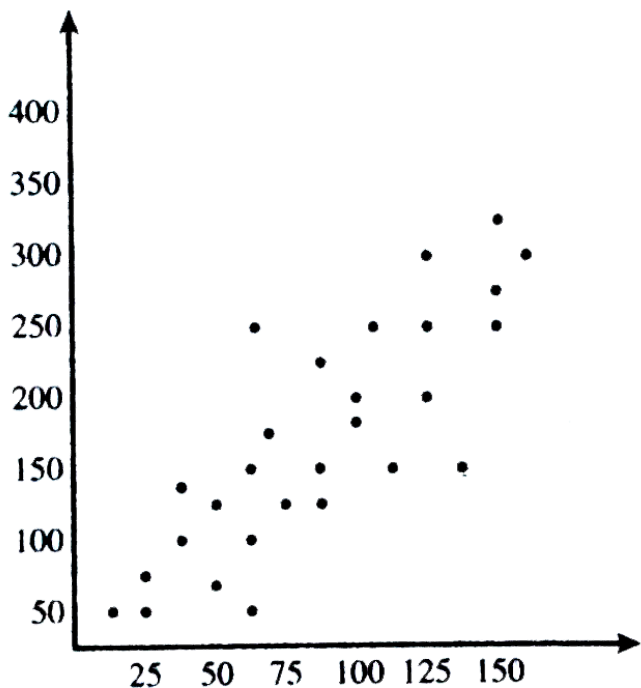
C. If he takes the A train, he is more likely to be 15 minutes late than with the B train.

D. If he takes the A train , he is more likely to arrive on time.

Answer: A



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12.

For the scatterplot above , which is closest to the slope of the line of best fit ?

A. $\frac{1}{2}$

B. 1

C. 2

D. 3

Answer: C



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	Male	Female	Total
Game	279	200	479
Commercials	81	156	237
Won't watch	132	160	292
Total	492	516	1008

13.

The table above shows the result of a survey of adults over 18. Each person had to pick one of 3 choices : looking forward to a televised game,

looking forward to the commercials , or not planning to watch . Based on the table , if a woman was polled at random , what is the probability , as a percent , that she would respond that she was looking forward to the commercials ?

A. 15

B. 30

C. 51

D. 66

Answer: B



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14.

Scores	51-60	61-70	71-80	81-90	91-100	
Frequency	1	6	9	10	5	31

The frequency chart shows test scores for a certain class. The total number of student is 31. If a student in the class was picked at random , what is the probability that the student's score was below 71 ?



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15. A population of bacteria doubles every 2 hours. What is the percent increase after 4 hours ?



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16. Boyle's law states that when a sample of gas is compressed at a constant temperature , the pressure of the gas is inversely proportional to the volume of the gas . If a sample of air occupies $0.106m^3$ at $25^\circ C$, the pressure is 50 kPa (kilopascals). Find the new pressure , in kPa,

if the temperature remains constant and the sample expands to a volume of $0.3m^3$.



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17. In a men's slalom race . John Li skied in a time of 120.86 seconds for 2 runs, about 1 standard deviation slower than the mean. If skiing times follow a normal distribution , about how many of the 48 skiers finishing the race would you expect skied slower than John Li ?

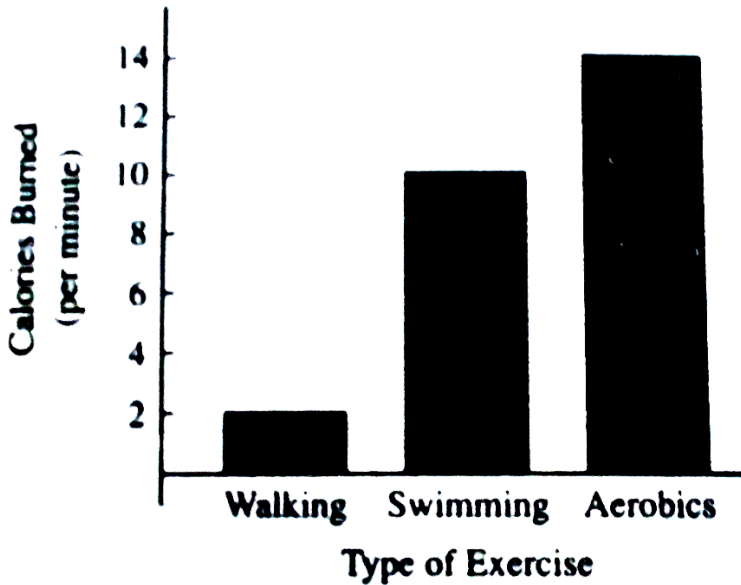


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18. The above bar graph shows the number of calories burned per minute for three types of exercise , assuming that the exercise is performed vigorously. Jackie spent an hour exercising vigorously . She spent twice as much time doing aerobics as she did walking, and $1\frac{1}{2}$ times as much time swimming as she did aerobics . According to the graph, how many calories did Jackie expect to burn during that

hour of exercise ?

Calories Burned for Exercise



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19. A typing class in elementary school is divided into three groups . The Red Robins, with 6

students , has an average typing speed of 60 words per minute , the Blue Wax Bills, with 10 students , has an average typing speed of 45 words per minute , and the Gold Finches , with 16 students , has an average typing speed of 30 words per minute. What is the average (arithmetic mean) of the typing speeds, in words per minute , for the class ?

A. 27.3

B. 32.0

C. 40.3

D. 45.0

Answer: C



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