MATHS

BOOKS - PRINCETON MATHS (ENGLISH)

ADVANCED ARITHMETIC

Example

1. An acidic is mixed so that the mass ratio of nitric acid to water is 2:7 . If a total of 270g of

acid solution is mixed, how many more g of water are there than the nitric acid?

A. 60

B. 110

C. 150

D. 210

Answer: C

Watch Video Solution

2. In mass hoover's class, the ratio of boy to girls is x to y. If the total number of children in the class is five times the number of boys in the class, and x and y are integers, which of the following ccould be the sum of x and y?

A. 9

B. 10

C. 11

D. 12

Answer: B

Watch Video Solution

3. If 2 packages contain a total of 12 doughnuts, how many doughnuts are there in 5 packages?

A. 24

B. 30

C. 36

D. 60

Answer: B

Watch Video Solution

4. Gary is using a 3D printer to create a miniature version of himself. The sale of miniature is 0.2 inches to 1 foot of gary's actual height. If gary is 5 feet and 9 inches tall, what will be the height of his 3D- printed miniature?

A. 2.0 inches

B. 2.3 inches

C. 2.6 inches

D. 2.9 inches

Answer: B

Watch Video Solution

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

B. $\frac{3}{4}$

C. 18

D. 54

Answer: C

Watch Video Solution

6. Abusiness paid $300 to rent a piece of office equipment for one year. The rent was then increased by 10% each year thereafter. How

much will the company pay for the first three years it rents the equipment?

A. 920

B. 960

C. 990

D. 993

Answer: D

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7. A number is incresed by 25% and then decreased by 20%. The result is what percent of original number?

A. 80

B. 100

C. 105

D. 120

Answer: B

Watch Video Solution

8. Becca deposites $100 into a bank account that earns an annual interest rate of 4% . If she does not make any additional deposits and makes no withdrawals how long will it take her, in year, to increase the value of her account by at least 60%?

A. 12

B. 15

C. 25

D. 30

Answer: B

Watch Video Solution

9. A summer beach volleyball league has 750 players in it. At the start of the season, 150 of the players are randomly chosen and polled on whether games will be played while it is raining, or if of the polled players would prefer to play in the rain. The margin of error on the poll is $\pm 4\%$. What is the range of players in the entire league that would be expected to

prefer to play volleyball in the rain rather than cancel the game?

A. $24 - 32$

B. $39 - 48$

C. $150 - 195$

D. $180 - 240$

Answer: D

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10. Maria has taken four chemistry tests and have an average (arithmetic mean) score of 80. IF the scores a 90 on her fifth chemistry test, what is her average for these five tests?

A. 80

B. 81

C. 82

D. 84

Answer: C

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11. The average (arithemic mean) of a list of 5 numbers is n. When an additional number of added to the list, the average of all 6 numbers in n+3. Which of the following is the value, in terms of n, of the added to the list?

A. $6n + 18$

B. $5n$

C. $n + 18$

D. $n + 6$

Answer: C

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12. Brian plans to complete a 100-mile bike race for charity. According to his registration materials, he will need to ride at an average speed of 12.5 miles per hour if he wants to complete the course before it closes. On a pratice ride the week before the race, Brain rides 60 miles and trackes his speed. For the first 30 miles, his average speed is 16 miles per

hour, and for the next 30 miles, his average speed is 15 miles per hour. If Brian can match these speeds for the first 60 miles of the charity race, then he rests for that total of 1 hour after that, what approximately speed must he maintain for the last 40 miles in order to complete the ride on time?

A. 8 miles per hour

B. 10 miles per hour

C. 13 miles per hour

D. 14 miles per hour

Answer: C

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13. A bag contains 7 blue marbles and 14 marbles that are not blue. If one marbles is drawn at random from the bag, what is the probability that the marbles is blue?

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

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

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

D. $\frac{3}{7}$

Answer: A

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14. A jar contains only red marbles and white marbles. If the probability of selecting a red marble is $\frac{r}{y}$, which of the following expressions gives the probability of selecting a white marble, in terms of r and y?

A. $\frac{r-y}{y}$

B. $\frac{y-r}{y}$

C. $\frac{r}{y}$

D. $\frac{y}{r}$

Answer: B

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15. When trees become iron deficient, their leaves turn yellow prematurely. A botanist is testing iron doped fertilizers on maple trees with iron deficiencies. The botanist has

selected 200 maple trees in the state of Wisconsin that have been identified as having an iron deficiency Half of the trees are randomly chosen to recieve the iron-doped fertilizer, while the other half are given a fertilizer without iron. The results from the test show that trees adminstered the iron doped fertilizer had fewer premature yellow leaves, indicating an increase in their iron levels. Which of the following statements best describes the results of the test?

A. The iron doped fertilizer will improve iron levels in any tree

B. The iron doped fertilizer reduces premature yellow leaves better than any other fertilizer.

C. The iron doped fertilizer will cause a significant increase in the iron levels.

D. The iron doped fertilizer will result in fewer premature yellow leaves in maple trees in Wisconsin.

Answer: D

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Advanced Arithmetic Drill Calculator Permitted Section

1. 20-2x

20-x

20

20+x

20+2x

What is the average (arithmetic mean) of the list of number above?

A. 20

B. 100

C. $20 + \frac{x}{5}$

D. $\frac{100}{x}$

Answer: A

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2. Steve ran a 12-mile race at an average speed of 8 miles per hour. If Adam ran the same race at an average speed of 6 miles per hour, how many minutes longer did Adam take to complete the race than did Steve?

A. 12

B. 16

C. 24

D. 30

Answer: D

Watch Video Solution

3. The amount of time tha Amy walks is directly proportional to the distance that she walks. If she walks a distance of 2.5 miles in 50 minutes, how many miles will she walk in 2 hours?

A. 4.5

B. 5

C. 6

D. 6.5

Answer: C

Watch Video Solution

4. A total of 140,000 votes was cast for two candidates. Skinner and Whitehouse. If Skinner won by a ratio of 4 to 3, how many votes were cast for Whitehouse?

A. $30,000$

B. $40,000$

C. $60,000$

D. $80,000$

Answer: C

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5. Of all the houses in a certain neighorhood, 80% have garages. Of those houses with garages, 60% have two car garages. If there are 56 houses with garages that are not two car garages, how many houses are there in the neighborhood?

A. 93

B. 117

C. 156

D. 175

Answer: D

Watch Video Solution

6. On Tuesday, a watchmaker made 4 more watches than he made during the previous day. If the made 16% more watches on Tuesday

than on Monday, how many watches did he make on Tuesday?

A. 20

B. 21

C. 25

D. 29

Answer: D

Watch Video Solution

7. 20-2x

20-x

20

20+x

20+2x

What is the average (arithmetic mean) of the list of number above?

A. 20

B. 100

C. $20 + \frac{x}{5}$

D. $\frac{100}{x}$

Answer: A

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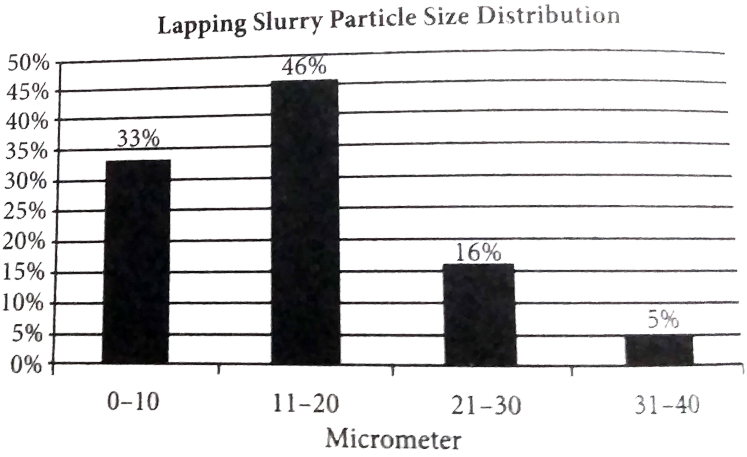

8.

A lapping slurry contains microbeads suspended in a solution and is used to polish

a silicon wafer by abrasion of the surface. The distribution of the particle size, in micrometers, is shown above. If the particle size distribution ranges were changed to 0-20 micrometers and 21-40 micrometers, which of the following is the closest to the ratio of the number of 0-20 micrometer microbeads to the number of 21-40 micrometer microbeads?

A. $3:1$

B. $4:1$

C. $5:2$

D. $9:1$

Answer: B

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A. 12

B. 16

C. 24

D. 30

Answer: D

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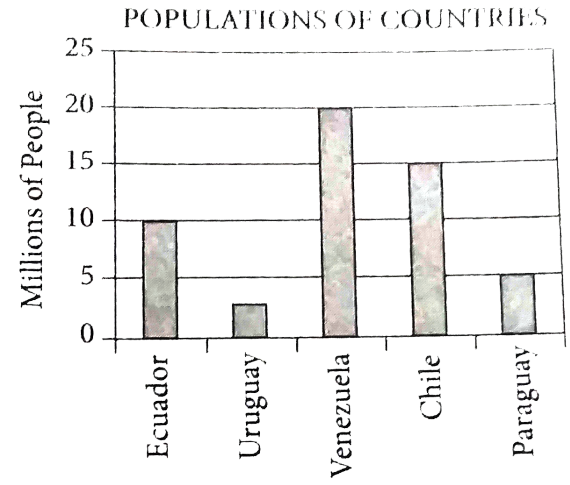

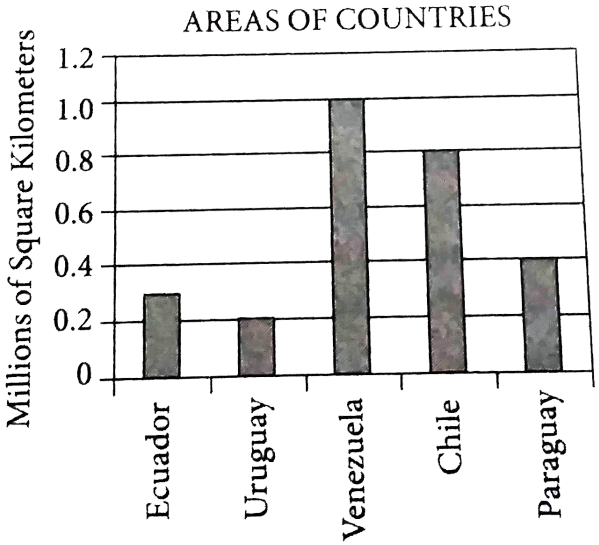

10.

The populations and areas of five countries are shown in the graph above. If population

density is defined as $\frac{popation}{area}$, which of the five countries has the highest population density?

A. Ecuador

B. Uruguay

C. Venezuela

D. Chile

Answer: A

Watch Video Solution

11. The amount of time tha Amy walks is directly proportional to the distance that she walks. If she walks a distance of 2.5 miles in 50 minutes, how many miles will she walk in 2 hours?

A. 4.5

B. 5

C. 6

D. 6.5

Answer: C

Watch Video Solution

12. A total of 140,000 votes was cast for two candidates. Skinner and Whitehouse. If Skinner won by a ratio of 4 to 3, how many votes were cast for Whitehouse?

A. 30000

B. 40000

C. 60000

D. 80000

Answer: C

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13.

Spice Prices of Distributor D	
Spice	Price Per Pound
Cinnamon	$8.00
Nutmeg	$9.00
Ginger	$7.00
Cloves	$10.00

The owner of a spice store buys 3 pounds each of cinnamon,nutmeg,ginger, and cloves from distributor D. She then sells of the spices at $2.00 per ounce. What is her total profit, in

dollars?

(1 pound = 16 ounces)

A. 192

B. 282

C. 384

D. 486

Answer: B

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14.

	Milligrams of Gold				
	1	2	3	4	5
Limestone	0.45	0.58	0.55	0.42	0.41
Granite	0.94	0.87	0.82	0.55	0.73
Gneiss	0.38	0.60	0.37	0.40	0.34

Five samples of each of three different rock types were collected on a hiking trip in Colorado. Each sample was analyzed for its gold content. The milligrams of gold found in each sample are presented in the table above. What is the percent difference of the average gold content in the granite samples when compared to the average gold content of the gneiss samples?

A. The gold content in the gneiss samples is 62% higher than the gold content in the granite samples.

B. The gold content in the granite samples is 62% higher than the gold content in the gneiss samples

C. The gold content in the gneiss samples is 87% higher than the gold content in the granite samples.

D. The gold content in the granite samples is 87% higher than the gold content in the gneiss samples.

Answer: D

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15. Of all the houses in a certain neighorhood, 80% have garages. Of those houses with garages, 60% have two car garages. If there are 56 houses with garages that are not two

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A. 60

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4. Gary is using a 3D printer to create a miniature version of himself. The scale of the miniature is 0.4 inches to 1 foot oto Gary's

actual height. If Gary is 5 feet and 9 inches tall, what will be the height of his 3D-Printed miniature? (12 inches=1 foot)

A. 2.0 inches

B. 2.3 inches

C. 2.6 inches

D. 2.9 inches

Answer: B

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5. The amount of time it takes to consume a buffalo carcass is inversely proportional to the number of vultures. IF it takes 12 vultures 3 day to consume a buffalo, how many fewer hours will it take there are 4 more vultures?

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

B. $\frac{3}{4}$

C. 18

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Watch Video Solution

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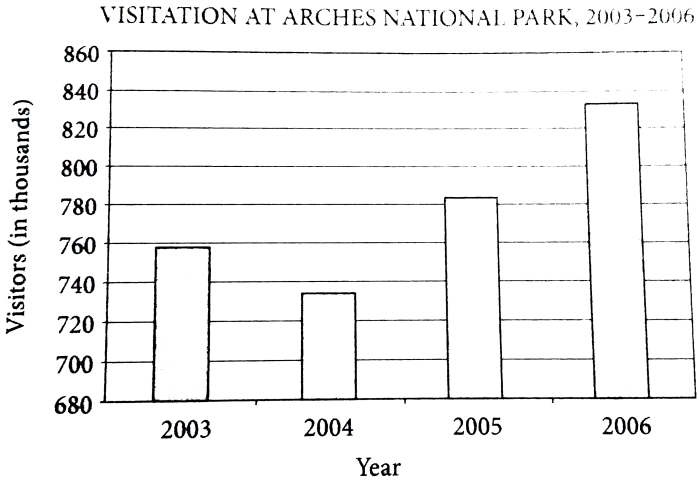

The chart above shows the number of visits, in thousands, at Arches National park for the years 2003 to 2006. Which of the following is

the closest approximation of the percent increase in the number of visits from 2004 to 2006?

A. 0.05

B. 0.15

C. 0.2

D. 1.15

Answer: B

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9. Becca deposits $100 into a bank account that earns an annual interest rate of 4%. If she does not make any additional deposits and makes no withdrawals, how long will it take her, in years, to increase the value of her account by at least 60%?

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B. 39-48

C. 150-195

D. 180-240

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A. 80

B. 81

C. 82

D. 84

Answer: C

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12.

Charge No.	Battery Life
1	1:11
2	1:05
3	0:59
4	0:55
5	0:55
6	0:54
7	0:54

A toy drone is opened and charged to full battery life. The table above shows the duration of the battery life in hours and minutes between charges. What is the average battery life for the first five charges?

A. 55 minutes

B. 58 minutes

C. 1 hour and 1 minute

D. 1 hour and 5 minutes

Answer: C

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13. The average (arithemic mean) of a list of 5 numbers is n. When an additional number of added to the list, the average of all 6 numbers

in n+3. Which of the following is the value, in terms of n, of the added to the list?

A. 6n+18

B. 5n

C. n+18

D. n+6

Answer: C

Watch Video Solution

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Limestone	0.45	0.58	0.55	0.42	0.41
Granite	0.94	0.87	0.82	0.55	0.73
Gneiss	0.38	0.60	0.37	0.40	0.34

Five samples of each of three different rock types were collected on a hiking trip in Colorado. Each sample was analyzed for its gold content. The milligrams of gold found in each sample are presented in the table above. How much larger is the median of the amount of gold in the granite samples than that of the limestone samples?

A. 0.00

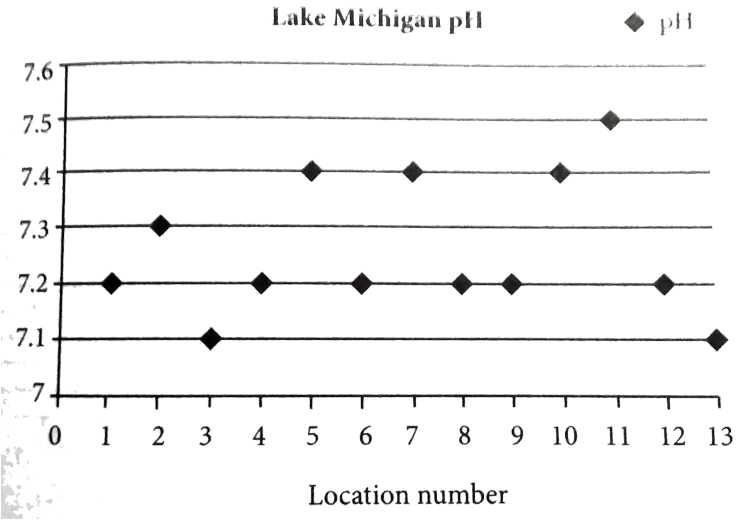
B. 0.37

C. 0.45

D. 0.55

Answer: B

 Watch Video Solution



15.

The pH of the water in Lake Michigan was tested at 13 locations along the illions shoreline. The data is presented in the scatterplot above. Which of the following best represents the mode of the pH in the collected data?

A. 7.2

B. 7.3

C. 7.4

D. 7.5

Answer: A

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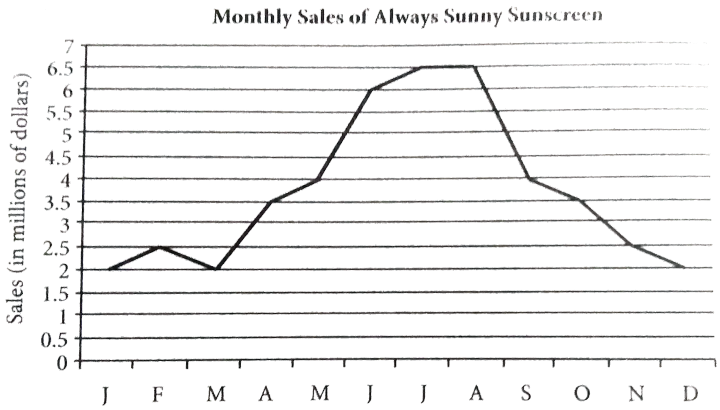
16.



The forecasted monthly sales of Always Sunny Sunscreen are presented in the figure above. Which of the following best describes the range of monthly sales , in millions of dollars, throughout the year shown?

A. 2.5

B. 3.5

C. 4.0

D. 4.5

Answer: D

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17.

Precious Metals in Catalytic Converters, in grams					
1	2	2	3	4	6
6	6	9	9	10	10
11	13	14	14	15	17

The grams of precious metals is recycled catalytic converters were measured for a variety of automobiles. The data is presented

in the table above. If the lowest data point,1gram, and highest data points , 17 grams,are removed from the set, which of the following quantities would change the most?

A. Mode

B. Mean

C. Range

D. Median

Answer: C

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18. Brian plans to complete a 100-mile bike race for charity. According to his registration materials, he will need to ride at an average speed of 12.5 miles per hour if he wants to complete the course before it closes. On a pratice ride the week before the race, Brain rides 60 miles and trackes his speed. For the first 30 miles, his average speed is 16 miles per hour, and for the next 30 miles, his average speed is 15 miles per hour. If Brian can match these speeds for the first 60 miles of the

charity race, then he rests for that total of 1 hour after that, what approximately speed must he maintain for the last 40 miles in order to complete the ride on time?

A. 8 miles per hour

B. 10 miles per hour

C. 13 miles per hour

D. 14 miles per hour

Answer: C

Watch Video Solution

19. A bag contains 7 blue marbles and 14 marbles that are not blue. If one marble is drawn at random from the bag, what is the probability that the marble is blue?

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

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

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

D. $\frac{3}{7}$

Answer: A

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20. A jar contains only red marbles and white marbles, If the probability of selecting a red marble is $\frac{r}{y}$, which of the following expressions gives the probability of selecting a white marble , in terms of r and y?

A. $\frac{r-y}{y}$

B. $\frac{y-r}{y}$

C. $\frac{r}{y}$

D. $\frac{y}{r}$

Answer: B

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21.

Size of College Manhattan High Students Plan to Attend

	Small (Fewer than 5,000 students)	Medium (From 5,000 to 10,000 students)	Large (More than 10,000 students)	Total
Manhattan High East	25	155	75	255
Manhattan High West	39	112	98	249
Total	64	267	173	504

At two high schools, those planning to attend college after graduation were polled. The sizes of the colleges they planned to attend based on student body sizes were tabulated in the table above. The 255 polled students from

Manhattan high east Had an average SAT score above 1100, and the 249 polled students from Manhattan High west had an average SAT score below 1100. IF a poll respondent were chosen at random from those planning to attend a college with atleast 5,000 students , what is the probability that the respondent would be enrolled at Manhattan High west?

A. $\frac{210}{249}$

B. $\frac{210}{440}$

C. $\frac{230}{440}$

D. $\frac{440}{504}$

Answer: B

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22.

Grade	Activity	Price per item	Funds raised from activity
9th	Car Wash	$5.00 per car	$255.00
10th	Bake Sale	$2.00 per cookie	$360.00
11th	Magazine Sales	$2.50 per magazine	$337.50
12th	Bake Sale	$1.50 per cookie	$180.00

How many cars did the 9th grade class wash during the car wash?

A. 5

B. 51

C. 122

D. 180

Answer: B

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23.

<>br> How many more cookies were sold by the 10th grade than were sold by the 12th grade?

A. 60

B. 90

C. 120

D. 150

Answer: A

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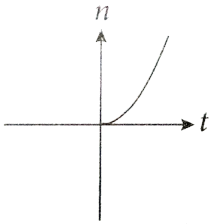
24.

Temperature in °F (t)	Number of Customers (n)
10	4
20	9
30	37
40	66
50	100

A coffee shop noticed that the outside temperature affected the number of customers who came to the shop that day, as

shown in the table above. Which of the following graphs best represents the relationship between the outside temperature t, and the number of customers,n, as indicated by the table?

A.



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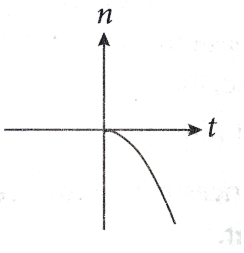
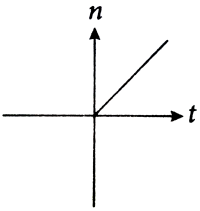
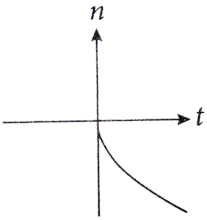


C.



D.



Answer: A

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25. When trees become iron deficient, their leaves turn yellow prematurely. A botanist is

testing iron doped fertilizers on maple trees with iron deficiencies. The botanist has selected 200 maple trees in the state of Wisconsin that have been identified as having an iron deficiency Half of the trees are randomly chosen to recieve the iron-doped fertilizer, while the other half are given a fertilizer without iron. The results from the test show that trees adminstered the iron doped fertilizer had fewer premature yellow leaves, indicating an increase in their iron levels. Which of the following statements best describes the results of the test?

A. The iron-doped fertilizer will improve iron levels in any tree.

B. The iron-doped fertilizer reduces premature yellow leaves better than any other fertilizer

C. The iron-doped fertilizer will cause a significant increase in iron levels.

D. The iron-doped fertilizer will result in fewer premature yellow leaves in maple trees in Wisconsin.

Answer: D

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