MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

PRACTICE TEST 1

Multiple Choice

1. If $x^{-2} = 64$, what is the value of $x^{\frac{1}{3}}$?

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

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

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

D. 2

Answer: C

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2. $C(n) = 110n + 900$

The cost of airing a commercial on television, C, is modeled by the function above where n is the number of times the commercial is aired. Based on this model, which statement is true?

A. The commercial costs $0 to produce and $110 per airing up to $900.

B. The commercial costs $119 to produce and $900 each time is aired.

C. The commercial costs $900 to produce and $110 each time it is a aired.

D. The commercial costs $110 to produce and can air an ulimited number of times.

Answer: C

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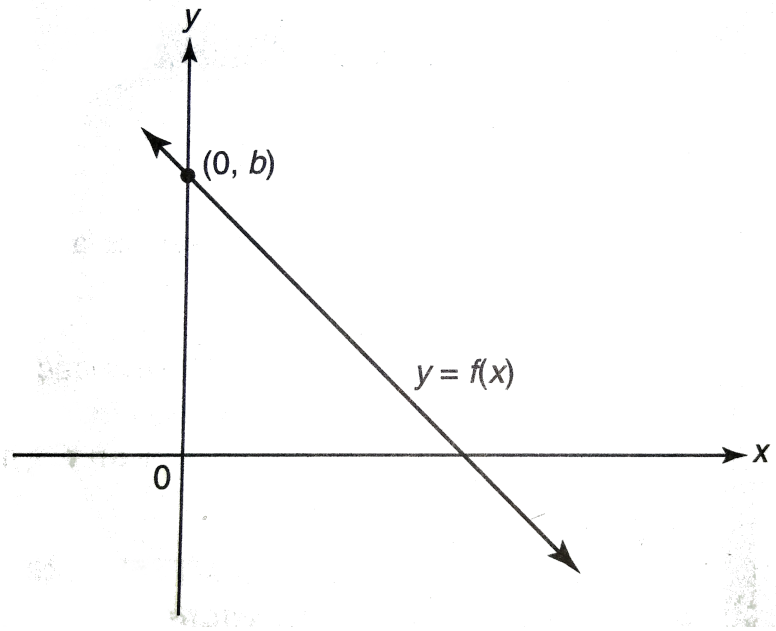

3.

The figure above shows the graph of the linear function, $y = f(x)$. If slope of the line is -2 and f(3)=4, what is the value of b?

A. 8

B. 9

C. 10

D. 11

Answer: C

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4. If $x - 3$ is 1 less than $y + 3$, then $x + 2$ exceeds y by what amount?

A. 4

B. 5

C. 6

D. 7

Answer: D

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5. the weights of 5 boxes of srews vary from 2.85 pounds to 3.45 pounds. If w represents the weight, in pounds, of one of these boxes, which of the following must be true?

A. $|w - 2.85| \leq 0.3$

B. $|w - 3.15| \leq 0.3$

C. $|w - 5| \leq 0.3$

D. $|w - 0.3| \leq 3.15$

Answer: B

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6. Mikala exercise in her gym by joggging on the treatmill at a average rate of 4 miles per hour and then pedaling on a stationary bicycle at an average rate of 8 miles per hour. In her workout , she jogs the equivalent of x miles and bicycles the equivalent of y miles. If MIkala works out for at least 45 minutes, which of the following is true?

A. $\frac{x}{4} + \frac{y}{8} \geq \frac{3}{4}$

B. $x + \frac{y}{4} \geq \frac{3}{4}$

C. $4x + 8y \geq 45$

D. $\frac{4}{x} + \frac{8}{y} \geq 45$

Answer: A

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7. If $7^k = 100$, what is the value of $7^{\frac{k}{2}+1}$?

A. 18

B. 51

C. 57

D. 70

Answer: D

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8. $3y + 6 = 2x$

$2y - 3x = 6$

The system of equations above can best be described as having

A. no solution

B. one solutions with the graphs intersecting at right angles in the xy-plane

C. one solution with the graphs not intersecting at right angles in the xy-plane.

D. infinitely many solutions.

Answer: C

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9. Which of following statements is true about the parabola whose equation In the xy-plane is $y = (2x - 6)(x + 1)$?

I. The line $x = 2$ is vertical line of symmetry.

II. The minimum value of y is -8.

III. The y-intercepts is -6.

A. I and III only

B. II and III only

C. I and II only

D. I, II, and III

Answer: B

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10. A survey is conducted in which 60% of the individuals who responded indicated that they do not support issuing a bond to help raise money to fund the construction of a new sports arena in their city. A statistician calculates the confidence level to be 95% for an interval of 5% below and above the 60% mark. What conclusions is best supported by this information?

A. 95% of the people surveyed do not support the issuing of the bond.

B. The probability that a person selected at random from the sample does not support the issing of the bond ranges from 0.57 to 0.63.

C. The probability that a person selected at random from the sample supports the issuing of the bond is 0.4.

D. If the survey were to be repeated 100 times, 95% of the times the number of people who would not support the issuing of the bond would range from 55% to 65% of those surveyed.

Answer: D

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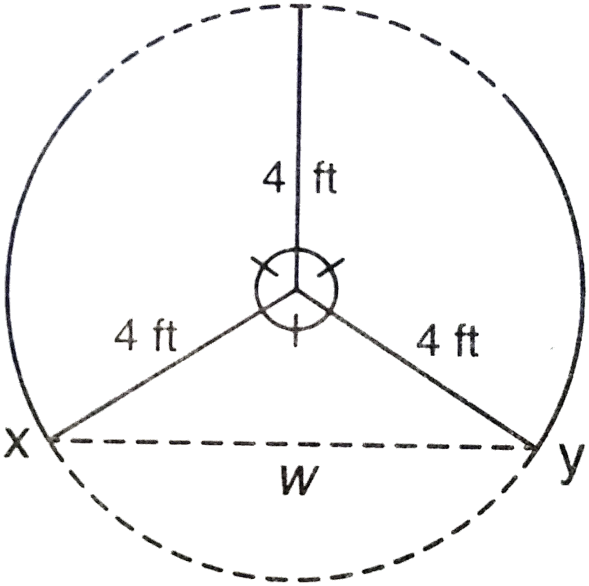

11.

The accompanying diagram shows a revolving door with three panels, each of which is 4 feet long. What is

the number of feet in the width, w, of the opening between points x and y?

A. $\frac{4}{\sqrt{3}}$

B. $4\sqrt{3}$

C. $8\sqrt{2}$

D. $8\sqrt{3}$

Answer: B

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12. Impedance measures the oppositio of an electrical circuit to the flow of electricity. The total impedance in

a particular circuit is give by the formul $Z_r = \frac{Z_1 \cdot Z_2}{Z_1 + Z_2}$. What is the total impedance of a circuit, Z_1, if $Z_1 = 1 + 2i$ and $Z_2 = 1 - 2i$[Note: $i = \sqrt{-1}$]

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

B. $2i$

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

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

Answer: D

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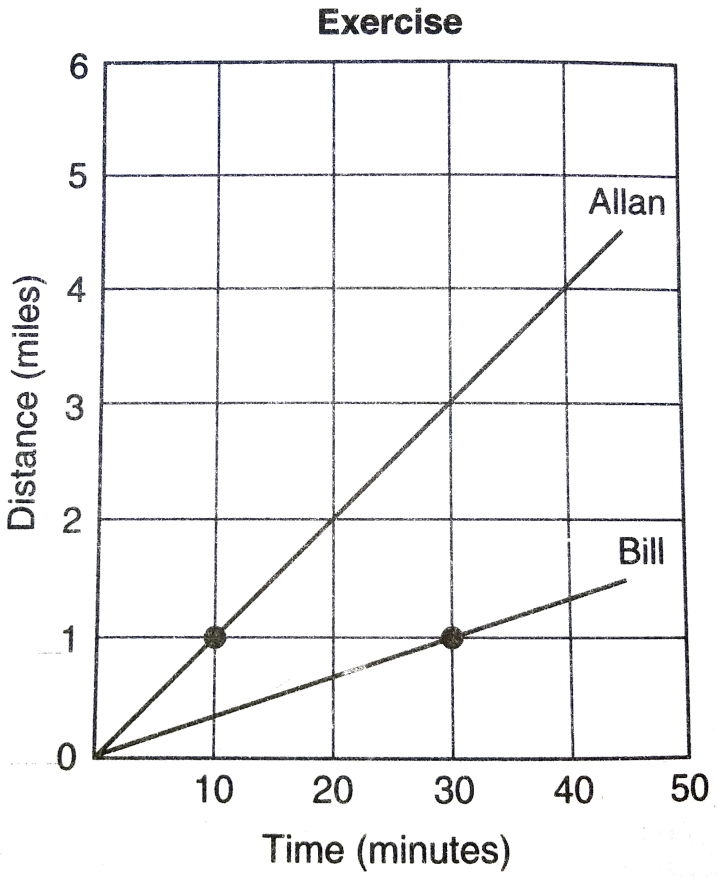

13.

At 9:00A.M. Allan began jogging and Bill began walking at constant rates around the same circular $\frac{1}{4}$ mile track. The figure above compares their times in minutes and corresponding distances in miles. Which

statement or statements must be true?

I. Bill's average rate of walking was 2 miles per hour.

II. At 9:00A.M. Allan had jogged $\frac{3}{5}$ mile more than Bill had walked.

III. At 9:30 A.M. Allan had completed 8 more laps around the track than Bill.

A. I only

B. II onlu

C. I and II only

D. I and III only

Answer: D

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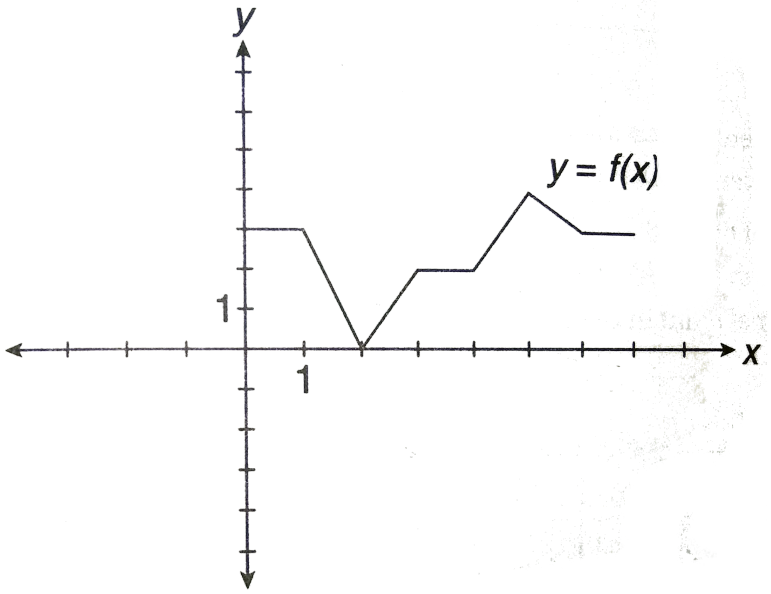

14.

The figure above shows part of the graph of function f.

If $f(x + 6) = f(x)$ for all values of x, what is the value of f(23)?

A. 0

B. 2

C. 3

D. 4

Answer: D

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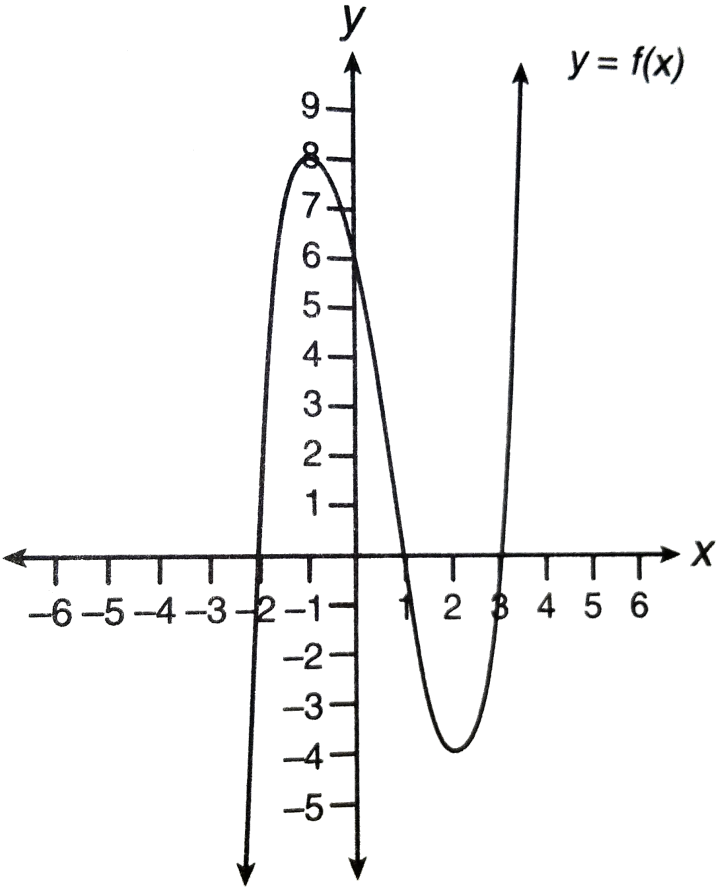

15.

Which function could represents the graph above?

A. $f(x) = (x - 6)(x^2 - 4x + 3)$

B. $f(x) = (x - 3)(x^2 + x - 2)$

C. $f(x) = (x-1)\left(x^2 - 5x - 6\right)$

D. $f(x) = (x+2)\left(x^2 - 4x - 12\right)$

Answer: B

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16. On a test that has a normal distribution of scores of 59 falls two standard deviations below the mean, and score of 74 is one standard deviation above the mean. If x is an integer score that lies between 2.5 and 3.0 standard deviations above the means. What is a possible value of x?

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17.

Hours Worked in a Week	Total Payment
8	$108.00
23	$310.50
17	$229.50

Andrew keeps track of his paychecks over the past several weeks, recording the number of hours he worked and his total payments as indicated in the table above. Hw wants to model the relationship between h hours worked and total payments, p , in dollars, using an equation of the form p=kh where k is a constant. Based on the data in the table, what value of k should be use?

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18. If $\frac{-3}{x} + 4 \leq -11$ and $x > 0$, what ist he greatest possible value for x?

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19. The equation of a circle in the xy-plane is $x^2 + 4x + y^2 - 10y = 20$. If the line x=k intersects the circle in exactly one point, what is the possible value of k?

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20.

x	1	2	3	4	5
$f(x)$	3	4	5	6	7

x	3	4	5	6	8
$g(x)$	4	6	8	10	7

The tables above gives the values of functions f and g for several values of x. If $g(f(b)) = 8$, what is the value of b?

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21. If $(2b - 7)(2b + 7) = 1$, what is the value of $2b^2$?

A. 15

B. 25

C. 32

D. 50

Answer: B

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22. The number of donation pledges, p, made to a charity d days after the charity began a campaign for donations can be approximately by the equation $p = 117 + 32d$. What is the best interpretation of the number 32 in this equation?

A. The number of donation pledges received before the campaign for donations started.

B. The total number of donations pledges received during the campaign.

C. The number of donation pledges received each day of the campaign.

D. The number of donation pledges made on the test of the campaign.

Answer: C

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23. A long-distance telephone call costs $1.80 for the first 3 minutes and $0.40 for each additional minutes. If the charge for an x-minutes long distance call at this rate was $4.20, then x=

A. 7

B. 8

C. 9

D. 10

Answer: C

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Gender	Type of College				
	4-Year Same State	2-Year Same State	4-Year Out-of-State	None	Total
Male	64	26	22	7	119
Female	41	19	15	6	81
Total	105	45	37	13	200

24.

Based on the data in the table above, which of the following statements must be true?

I. For every 3 men who applied to a same state collage, 2 women applied to a same state collage.

II. If a female student is selected at random the probability that she did not apply to a 2-year collage is greater than 75%.

III. Of the students who applied to a same state collage, 40 % were females

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

Answer: D

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25. If $3x - 1 = x - \frac{7}{9}$, what is the value of $2x + 1$?

A. $\frac{11}{9}$

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

C. $\frac{25}{9}$

D. $\frac{10}{3}$

Answer: A

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26. The price of gas increased by 12% per gallon sometime during the first fiscal quarter and then decreased by 25% per gallon by the end of the second fiscal quarter. The final price of gas gallon at the end of the second quarter decreased by what percent compared to the starting price at the beginning of the first fiscal quarter?

A. $13\ \%$

B. $16\ \%$

C. $18.5\ \%$

D. $20\ \%$

Answer: B

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27. A population, T(x), of wild turkeys, in a certain rural area is represented by the function, $T(x) = 17(1.15)^{2x}$, where x is number of years since 2010. According to this model, how many more turkeys

are in the population for the year 2015 than were avaible for 2010?

A. 46

B. 49

C. 51

D. 68

Answer: C

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28. If an equation of a parabola in the xy-plane is $f(x) = -(x+2)^2 - 1$, what are the coordinates of

the vertex of the parabola defined by $g(x) = f(x - 2)$?

A. $(0, -1)$

B. $(4, -1)$

C. $(-2, -3)$

D. $(-2, 1)$

Answer: A

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29. A city planner estimates that due to lower birth rates and changing demographics, enrollment in city's

public schools will decrease at the rate of 16% per year for the next 5 years. If the city planner uses the equation $P = P_0(r)^n$ to estimate the school enrollment, P, after n years, what should be used for the value of r?

A. 1.16

B. 0.84

C. 0.80

D. 0.16

Answer: B

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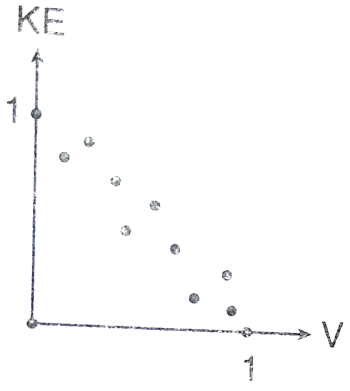

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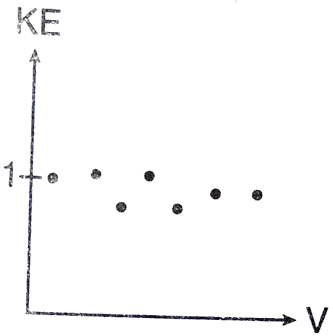

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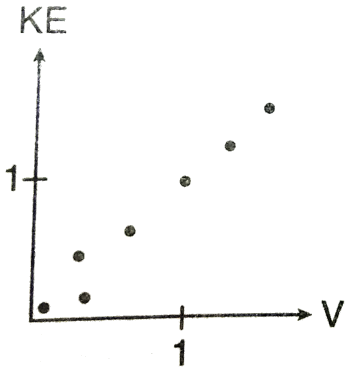

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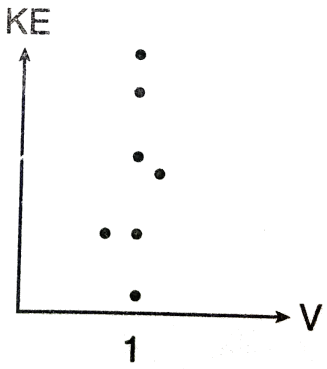

(4)

30.

In the physics lab, a student determined the kinetic energy, KE, of an object at various velocities, V, and found a strong positive association between KE and V.

Which of the above scatterplots show this relationship?

A. Graph (1)

B. Graph (2)

C. Graph (3)

D. Graph (4)`

Answer: B

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31. The average (arithmetic mean) of a, b, c, and d is 3 times the median. If $0 < a < b < c < d$, what is a in

terms of b, c, and d?

A. $5(b + c) - d$

B. $3(b + c) + d$

C. $5(b + c) + d$

D. $3(b + c) - d$

Answer: A

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32. A person spent a total \$720 for dress shirts and sport shirts, each priced at \$35 and \$20, respectively. If the person purchased two \$35 dress shirts for each

$20 sport shirts, what is the total number of shirts puchased?

A. 16

B. 21

C. 24

D. 28

Answer: C

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33. If 10 centimeters of blood contains 1.2 grams of hemoglobin, how many grams of hemoglobin are

contained in 35 cubic centimeters of same blood?

A. 2.7

B. 3.0

C. 3.6

D. 4.2

Answer: D

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Players' Salaries (in 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
1.6	1.8	2.5	3.7	3.8	4.0
4.2	4.6	5.1	6.0	6.3	7.2
Total = 61.7 Million					

34.

The table above shows the annual salaries for the 24 members of a professional sports team in terms of millions of dollars. If the team signs an additional player to a contract worth 7.3 million dollars per year, which statements about the median and mean is true?

A. The median and mean will increase by the same amount.

B. The median will increase by a greater amount.

C. The mean will increase by a greater amount

D. Neither will charge

Answer: C

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35. $m = \frac{M}{\sqrt{1 - \frac{v^2}{c^2}}}$

The equation above describes, according to Einstein's theory of relativity, how the mass of an object increase with velocity where m is the mass of moving object, M is the mass the mass the object when it is not moving, v is the velocity of the object relative to a stationary

observer, and c is the speed of light. Which of the following expresses v in terms of m, M, and c?

A. $c\sqrt{1-\left(\frac{M}{m}\right)^2}$

B. $c\sqrt{1+\left(\frac{M}{m}\right)^2}$

C. $\sqrt{c^2+\left(\frac{M}{m}\right)^2}$

D. $\sqrt{c^2+\left(\frac{M}{m}\right)^2}-1$

Answer: A

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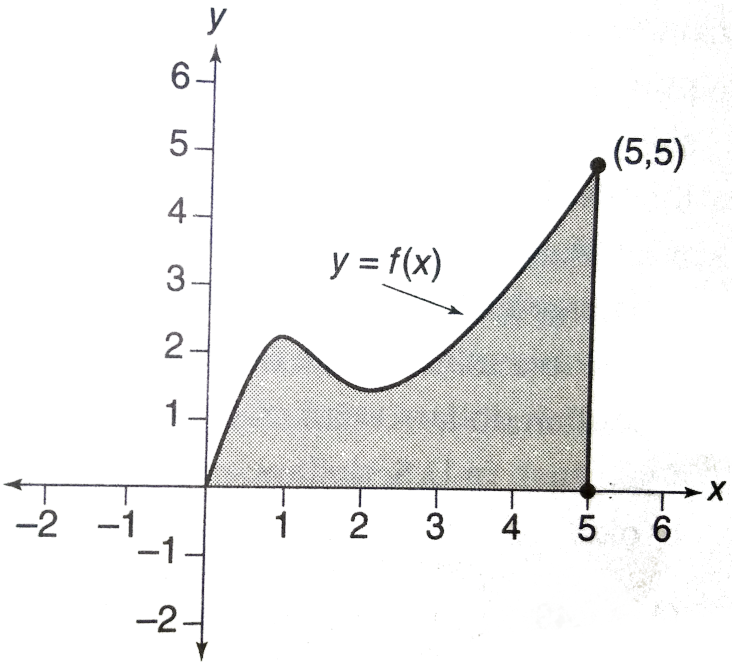

36.

Function f is defined for $0 \leq x \leq 5$, as shown in the accompanying figure. If (r, s) is a point inside the shaded region bounded by the x-axis, the line x=5 and y=f(x), which statement must be true?

I.$r + s \leq 5$

II.$s \leq f(r)$

III.$f \neq s$

A. I only

B. II only

C. III only

D. I and III only

Answer: B

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37. Natalie is plannin a school celebration and wants to have live music and food for everyone who attends. She has found a band that will charge her $750 and a caterer who will provide snacks and drinks for $2.25 per person. If her goal is to keep the average cost per

person between $2.75 and $3.25, how many people, p, must attend?

A. $225 < p < 325$

B. $325 < p < 750$

C. $500 < p < 1,000$

D. $750 < p < 1,500$

Answer: D

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38. If p(x) is a polynomial function with p(3)=0, which statement must be true?

A. p(x) is divisible by 3.

B. x-3 is factor of p(x)

C. p(x) is divisible by x+3

D. The highest power of x in p(x) is 3.

Answer: B

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39. A group of p people plan to contribute equality to the purchase of gifts that costs d dollars. If n of the p people decide not to contribute, by what amount in dollars does the contribution needed from each of the remaining people increase?

A. $\frac{d}{p-n}$

B. $\frac{pd}{p-n}$

C. $\frac{pd}{n(p-n)}$

D. $\frac{nd}{p(p-n)}$

Answer: D

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40. Which of the following statements includes a function divisible by 2x+1?

I. $f(x) = 8x^2 - 2$

II. $g(x) = 2x^2 - 9x + 4$

III. $h(x) = 4x^3 + 2x^2 - 6x - 3$

A. I only

B. I and II only

C. I and III only

D. I, II, and III

Answer: C

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41. When Sophie was born her parents invested a sum of $20,000 in her collage fund. They invested it at a nominal annual rate a 5% with interest compounded quarterly. Which equation could be used to find the

number of dollars, y, in the account, after 18 years assuming no other deposits or withdrawals are made?

A. $y = 20,000(1.05)^{18}$

B. $y = 20,000(0.21)^{18 \times 4}$

C. $y = 20,000(1.0125)^{\frac{18}{4}}$

D. $y = 20,000(1.0125)^{18 \times 4}$

Answer: D

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42. If function g is defined by g(x)=x-1 and 2g(c)=10, what is the value of g(3c)?

A. 6

B. 9

C. 15

D. 17

Answer: D

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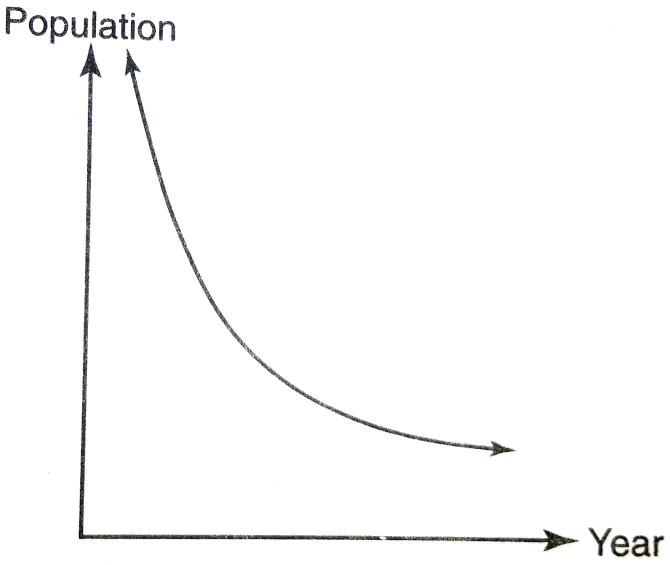

43.

The graph above shows how the size of a country's population has changed over time. Which of the following are the most likely underlying reasons for the type of graph shown?

A. A moderate increase in annual birthrates and a liberal immigration policy.

B. A large increase in annual birhtrates and increased life expectancy rates.

C. A liberal immigration policy and a opportunities.

D. The spread of a highly contagius fatal disease and a history of political strife and unrest.

Answer: D

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44. A teacher the united states wishes to purchase textbooks for her classroom when she goes on a trip to Canada, where they are on sale for 45 Canadian

dollars each. At the time of purchase one Canadian dollar can be exchanged for 0.76 U.S. dollars. Assuming she is able to exchange her U.S. dollars for Canadian dollars at no cost, what is the exact cost, in U.S. dollars, to purchase 30 books?

A. $\$849$

B. $\$1026$

C. $\$1350$

D. 1776

Answer: B

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45.

Age (years)	Average Pupil Diameter (mm)
20	4.7
40	3.9
60	3.1
80	2.3

The table above shows the average diameter, in millimeters, of a pupil in a person's eye as she or he grows older from age 20 to age 80. Which equation expresses the relationship between pupil diameter, p, and age a?

A. $p = -0.04a + 5.5$

B. $p = 0.04a + 3.9$

C. $p = 0.04a + 34.3$

D. $p = 0.235a$

Answer: A

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46. A small, open-top packing box, similar to a shoebox without a lid, is three times as long as it is wide, and half as high as it is long. Each square inch of the bottom of the box costs $0.80 to produce, while each square inch of any side costs $0.03 to produce. If x represents the number of inches in the width of the box,which of the following functions represents the cost, C, of producing the box?

A. $C(x) = 0.42x^2$

B. $C(x) = 0.60x^2$

C. $C(x) = 0.72x^2$

D. $C(x) = 0.96x^2$

Answer: B

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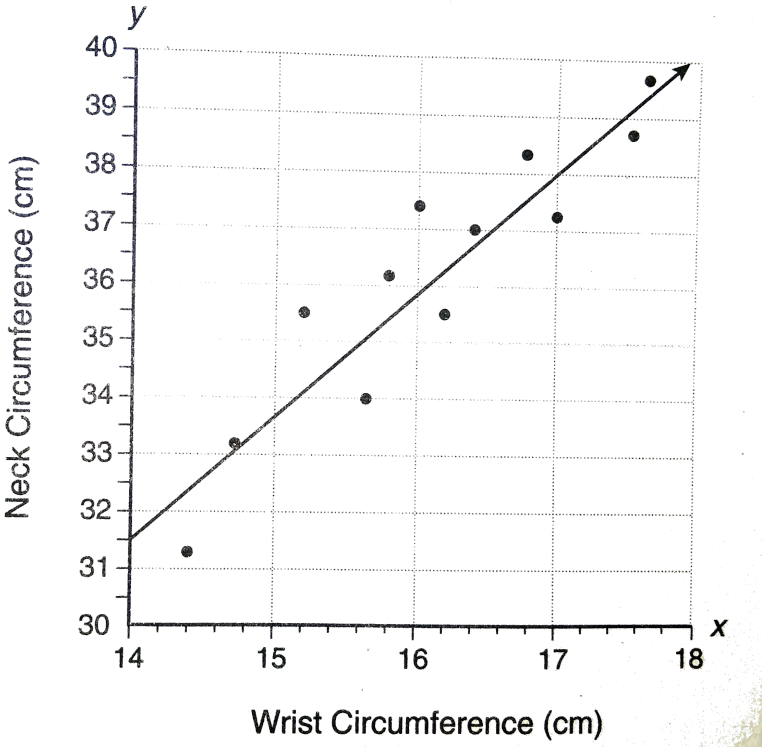

47.

The scatterplot above summarizes the wrist and neck circumference measurements, in centimeters, for 12 people. The line of best fit is drawn. What proportion of the measurements satisfy the inequality $|o - p| \leq d$, where o is the observed measurement, p

is corresponding measurement predicted by the line of best fit, and d is 0.5cm?

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

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

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

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

Answer: C

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48. An arch is built so that it has the shape of a parabola with the equation $y = -3x^2 + 24x$ where y

represents the height of the arch in meters. How many times greater is the maximum height of the arch than the width of the arch at its base?

A. 4

B. 6

C. 8

D. 10

Answer: B

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49. A political strategist wants to conduct a survey to determine how the likely voters in a given state of 10,000,000 people feel about a politician's stand on an infractructure spending plan. The strategist has a budget to make phone calls to 1,000 people. What would be the most effective approach for him to minimize the margin of error in his survey results?

A. Place calls to randomly selected phone numbers of resisdents within ths state.

B. Place calls to residents of the state's largest city who have indicated they are members of political party

C. Place call rural residents of the state who have demonstrated political activism

D. Place calls to places of business so that people can more likely be reached during the work day.

Answer: A

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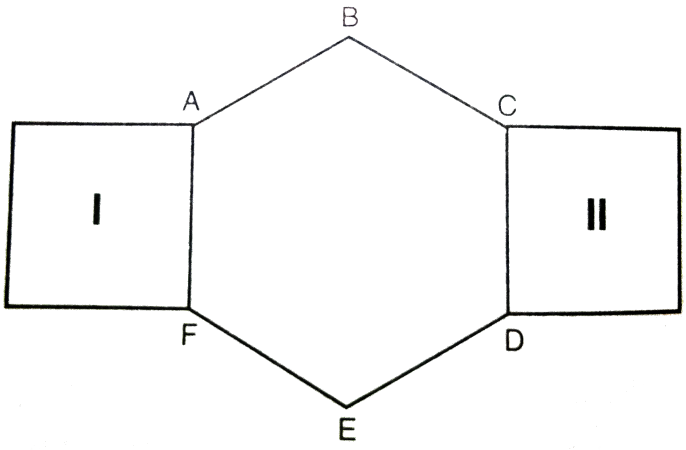

50.

A metal belt buckle is being designed so that it has the shape of a regular hexagon inn the center and squares at opposite ends as shown in the figure above where ABCDEF is a regular hexagon and figures I and II are squares. The hexagon will be gold plated and the two squares silver plated. The length of a side of each square is 6 centimeters. Which of the following is closest to the percent of the total surface area of the buckle that will be silver plated?

A. 41

B. 44

C. 47

D. 49

Answer: B

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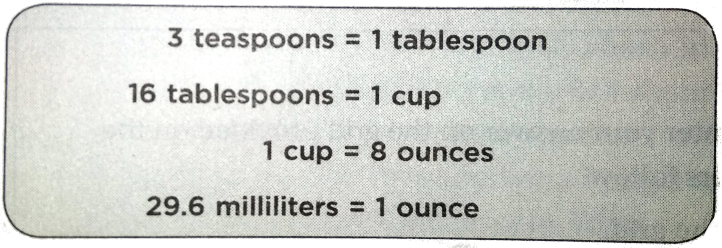
51.



Using the conversion relationships above, what is the

maximum number of 2-teaspoon doses of cough medicine that can be dipensed from a bottle that contains 225 milliliters of cough medicine?

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52. NASA's New Horizons Interplanetary probe has been making its way to Pluto since January 2006. In July 2015, it reached Pluto and sent a ratio transmission signal at speed of 1.86×10^5 miles per second. If the signal traveled a distance back to Earth of approximately 3.06×10^9 miles, how many minutes did it take for the signal to reach Earth, correct to the nearest 5 minutes?

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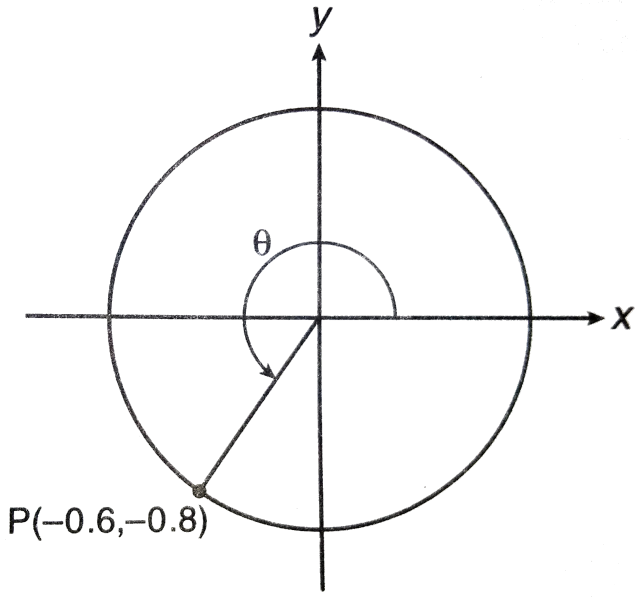

53.

If $P(-0.6, -0.8)$ is a point on the unit circle in the figure above,what is the exact value of $\tan\theta + \sin\theta$?

Watch Video Solution

54. If $a + 2b = 13$ and $8a + b = 20$, what is the value of $3a + b$?

Watch Video Solution

55. An opinion poll survey was conducted in which 120 sports fans and 75 non-sports fans participated. If the sample size was increased by 65 non-sports fans, how many sports fans should be added so that $\frac{3}{5}$ of those polled are sports fans?

Watch Video Solution

56. The Eye Surgery Institute just purchased a new laser madicine for $500,000 to use during eye surgery. The Institute must pay the inventor $550 each time the madicine is used. If the Institute charges $2,000 for each laser surgery that must be performed in order for the Institute to make a profit?

Watch Video Solution

57. Question 37 and 38 refer to the following information

The U.S. federal Government tracks the Consumer Price Index (CPI)- a comprehensive standard used to

estimate the average price change for the typical goods and services purchased by consumers. This measure gives economics a useful way to estimate the rates of the inflation or deflation, which reflects the respective general increase or decrease of prices of goods and services in the economy. The accompanying tables summarizes the changes in the CPI for the years 2005 through 2014, which can be assumed to be the corresponding percent rates of inflation.

Year	Annual	First Half of Year	Second Half of Year
2005	3.4	3.0	3.8
2006	3.2	3.8	2.6
2007	2.8	2.5	3.1
2008	3.8	4.2	3.4
2009	−0.4	−0.6	−0.1
2010	1.6	2.1	1.2
2011	3.2	2.8	3.5
2012	2.1	2.3	1.8
2013	1.5	1.5	1.4
2014	1.6	1.7	1.5

Q. An economist purchases a kitchen applience at the beginning of 2014 for $3,000. The sales person advises him that the only changes in prices for the applience since the beginning of 2012 have been due to inflation. Assuming that is the case, what would have been the purchase price for the applience at the beginning of 2012 correct to the nearest dollars?

Watch Video Solution

Watch Video Solution

58. Question 37 and 38 refer to the following information

The U.S. federal Government tracks the Consumer Price Index (CPI)- a comprehensive standard used to estimate the average price change for the typical goods and services purchased by consumers. This measure gives economics a useful way to estimate the rates of the inflation or deflation, which reflects the respective general increase or decrease of prices of goods and services in the economy. The accompanying tables summarizes the changes in the CPI for the years 2005 through 2014, which can be assumed to be the

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2010	1.6	2.1	1.2
2011	3.2	2.8	3.5
2012	2.1	2.3	1.8
2013	1.5	1.5	1.4
2014	1.6	1.7	1.5

Q. At a beginning of 2015, a retired person is shopping for a retirement annunity, which is an investment policy that will give him fixed monthly payments for the rest of his life. He would like the amount of his annuity payments to more than keep up with the rate of inflation. He decides that he will choose a policy that issuse payments that increase annually at a rate

of that is at least 1.5% greater than the average yearly compounded rate of inflation calculated from the period that extends from the second half of 2005 through the first half of 2008. What should be the minimum annual rate of increase in his monthly annuity payments, correct to the nearest tenth?

View Text Solution

Exercise

1. Which of the following epression is equaivalent to $a(4-a)-5(a+7)$?

A. $-2a-35$

B. $-2a+7$

C. $-a^2-a-35$

D. $-a^2-a+7$

Answer: C

Watch Video Solution

2. Which of the following inequalities orders the numbers $0.2, 0.03$ and $\frac{1}{4}$ from least to greater?

A. $0.2 < 0.03 < 1.4$

B. $0.03 < 0.2 < \frac{1}{4}$

C. $0.03 < \frac{1}{4} < 0.2$

D. $\frac{1}{4} < 0.03 < 0.2$

Answer: B

Watch Video Solution

3. If $x^2 + 4 = 29$, then $x^2 - 4 = ?$

A. 5

B. $\sqrt{21}$

C. 21

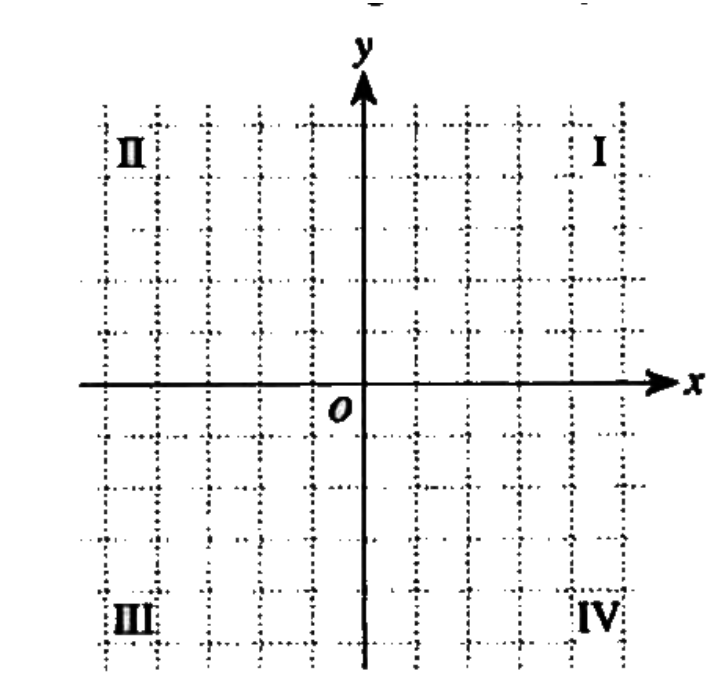
D. 25

Answer: C

Watch Video Solution

4. The vertices of a rectangle are $(-1, -2), (4, 2), (4, 3)$ and $(-1, 3)$. When the rantangle is graphed in the standard (x, y) coordinate plane below, what precent of the total area of the

rectangle lies in Quadrant III?



A. 0.08

B. 0.12

C. 0.125

D. 0.32

Answer: A

View Text Solution

5. In 1985, the cost of clothing for a certain family was $620. In 1995, 10 years later, the cost of clothing for this family was $ 1,000. Assuming the cost increased linearly, what was the cost of this family's clothing in 1991?

A. $908

B. $848

C. $812

D. $810

Answer: B

Watch Video Solution

6. The square root of a certain number is approximately 9.2371. The certain number is between what 2 intergers?

A. 3 and 4

B. 4 and 5

C. 9 and 10

D. 81 and 99

Answer: D

Watch Video Solution

7. A beg contains 10 pieces of flavored candy: 4 lemon, 3 strawberry, 2 grape , and 1 cherry. One piece of candy will be randomly picked from the bag. What is the probability the candy picked is Not grape flavoured?

A. $\frac{1}{5}$

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

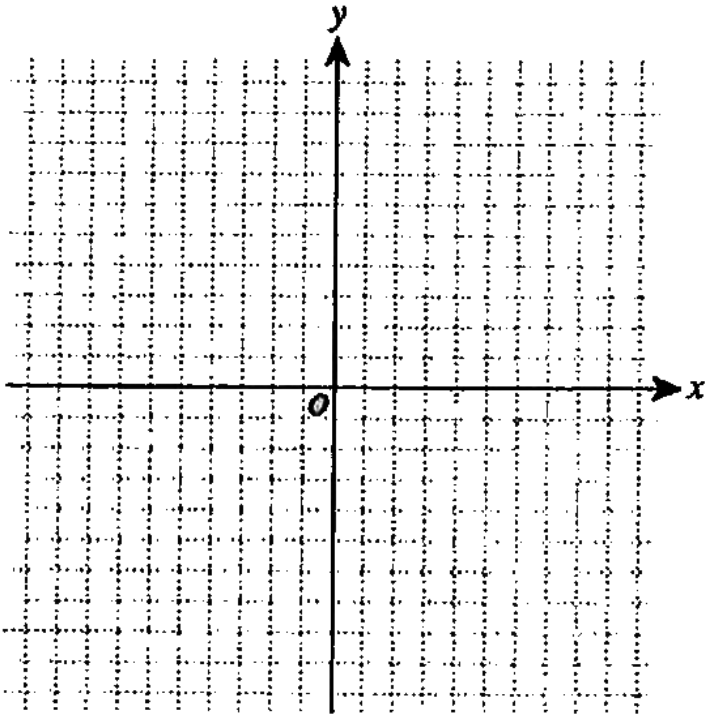
C. $\frac{1}{2}$

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

Answer: D

Watch Video Solution

8. When points A and B (-3, 4) are graphed in the standard (x,y) coordinate plane below, the midpoint of $\overline{AB}$ will be $(1, 2)$. What will be the coordinate of point A?



A. $(-7, 6)$

B. $(-2, 1)$

C. $(-1, 3)$

D. $(5, 0)$

Answer: D

View Text Solution

9. Andrea manages a company that currently has 116 customers, which is 8 more than twice the number of customers the company had 1 year ago. How many customers did the company had 1 year ago. How many customers did the company have 1 year ago?

A. 50

B. 54

C. 62

D. 66

Answer: B

Watch Video Solution

10. Joseph will have a 200-foot-long fence installed around his yard. The A+ Fence Company charges a $500.00 fee, plus a set amount per foot of fence. The A+ Fence Company has given Joseph an estimate of

$2,200.00 to install the fence around his yard. What is the set amount per foot of fence?

A. $ 4.00

B. $ 4.80

C. $ 8.50

D. $ 11.00

Answer: C

Watch Video Solution

11. For a math homework assignment, Kerla found teh area and perimeter of a room of her house. She

reported that the area of her rectangular living room is 180 square feet and that the perimeter is 54 feet. When drawing a sketch of her living room the next day, she realized that she had forgotten to write down the dimensions of the room. What are the dimensions of Karla's living room, in feet?

A. 9 by 20

B. 10 by 18

C. 12 by 15

D. 14 by 13

Answer: C

View Text Solution

12. Carrie's Chocolate shop and Tamika's Treat Shop both sell cadny in boxes. The table below lists the price (the total amount the customer pays) of each box of candy sold at the shops. For each shop, there is a linear relationship between the price of a box of candies and the number of candies in the box. These are the only numbers of candies that can be purchased at the shops.

Candies per box (n)	Price at Carrie's Chocolate Shop (c)	Price at Tamika's Treat Shop (t)
5	\$1.50	\$2.25
10	\$2.50	\$2.75
15	\$3.50	\$3.25
20	\$4.50	\$3.75
25	\$5.50	\$4.25
30	\$6.50	\$4.75

Jeremy has \$ 10.00 in quarters to spend on candy.

What is the maximum number of quarters he would have left after paying for a box 25 candies at Tamika's treat Shop?

(Note: Each quarter is worth $ 0.25)

A. 10

B. 17

C. 22

D. 23

Answer: D

Watch Video Solution

13. Carrie's Chocolate shop and Tamika's Treat Shop both sell cadny in boxes. The table below lists the price (the total amount the customer pays) of each box of candy sold at the shops. For each shop, there is a linear relationship between the price of a box of candies and the number of candies in the box. These are the only numbers of candies that can be purchased at the shops.

Candies per box (n)	Price at Carrie's Chocolate Shop (c)	Price at Tamika's Treat Shop (t)
5	\$1.50	\$2.25
10	\$2.50	\$2.75
15	\$3.50	\$3.25
20	\$4.50	\$3.75
25	\$5.50	\$4.25
30	\$6.50	\$4.75

At Tamika's Treat Shop. What is the average price per candy in a box of 20, to the nearest \$0.01 ?

A. $0.08

B. $0.19

C. $0.23

D. $0.30

Answer: B

Watch Video Solution

14. Carrie's Chocolate shop and Tamika's Treat Shop both sell cadny in boxes. The table below lists the price (the total amount the customer pays) of each box of candy sold at the shops. For each shop, there is a linear relationship between the price of a box of

candies and the number of candies in the box. These are the only numbers of candies that can be purchased at the shops.

Candies per box (n)	Price at Carrie's Chocolate Shop (c)	Price at Tamika's Treat Shop (t)
5	\$1.50	\$2.25
10	\$2.50	\$2.75
15	\$3.50	\$3.25
20	\$4.50	\$3.75
25	\$5.50	\$4.25
30	\$6.50	\$4.75

Which of the following equation gives the relationship between the price in dollars , c, and the number of candies ,n, in a box of cadies at carrie's chocolate shop ?

A. $c = 0.2n + 0.5$

B. $c = 0.3n$

C. $c = 0.5n + 1.5$

D. $c = n - 3.5$

Answer: A

Watch Video Solution

15. Which of the following is a solution to the equation $x^2 - 36x = 0$?

A. 72

B. 36

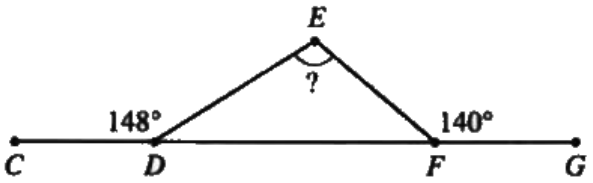
C. 18

D. 6

Answer: B

Watch Video Solution

16. In the figure below, vertices D and F of $\triangle DEF$ lie on $\overline{CG}$, the measure of $\angle CDE$ is 148°, and the measure of $\angle EFG$ is 140°. What is the measure of $\angle DEF$?



A. 72°

B. 98°

C. 100°

D. 108°

Answer: D

Watch Video Solution

17. A company ships notepads in rectangular boxes that each have inside dimensions measuring 9 inches long, 9 inches wide, and 12 inches tall. Each notepad is in the shape of a cube with an edge length of 3 inches. What is the maximum number of natepads that will fit in 1 closed box?

A. 10

B. 11

C. 12

D. 36

Answer: D

View Text Solution

18. The function f is defined as $f(x) = -4x^3 - 4x^2$. What is $f(-4)$?

A. -320

B. -192

C. 16

D. 192

Answer: D

Watch Video Solution

19. Which of the following (x,y) pairs is the solution for the system of equations $x + 2y = 4$ and $-2x + y = 7$?

A. (-2,3)

B. (-1,2,5)

C. (1,1,5)

D. (2,1)

Answer: A

20. Which of the following is a value of x that satisfies $\log_x 36 = 2$?

A. 4

B. 6

C. 8

D. 16

Answer: B

Watch Video Solution

21. A 5-inch-by-7-inch photograph was cut to fit exactly into a 4-inces-by-6- inch frame. What is the area, in square inches, of the part of the photograph that was cut off?

A. 2

B. 10

C. 11

D. 12

Answer: C

Watch Video Solution

22. A line contains the points A,B,C and D. Point B is between points A and C. Point D is between points C and B. Which of the following inequalities must be true about lengths of these segments?

A. BC lt AB

B. BD lt AB

C. BD lt CD

D. CD lt BC

Answer: D

Watch Video Solution

23. If x and y are positive intergers such that the greastest common factor of x^2y^2 and xy^3 is 45, then which of the following could y equal?

A. 45

B. 15

C. 9

D. 3

Answer:

View Text Solution

24. To test a new medicine, each of 300 volunteers was assigned a distinct number from 1 to 300. Next, a calculator was used to simulate drawing 150 balls from among 300 congruent balls. The balls were numbered the same way as the volunteers so that 150 volunteers to receive the new medication would be chosen without bais. THe other volunteers received a placebo. Weeks later, the 2 group were compared. Which of the following phrases best bescribes the company's testing?

A. Randomized census

B. Randomized experiments

C. Nonrandomized experiments

D. Randomized sample survey

Answer: B

Watch Video Solution

25. One cautions sign flashes evergy 4 second, and another caution sign flashes every 10 seconds. Ar a certain instant, the 2 signs flash at the same time. How many seconds elapse until the 2 sign next flash at the same time?

A. 6

B. 7

C. 14

D. 20

Answer: D

View Text Solution

26. For all nonzero values of a and b, the value of which of the following expressions is always negative?

A. a-b

B. $-a-b$

C. $|a| + |b|$

D. $-|a| - |b|$

Answer: D

Watch Video Solution

27. Graphed in the same standard (x,y) coodinate plane are a circle and a parabola. The circle has radius 3 and centre (0,0). The parabola has vertex (-3,-2), has a vertical axis of symmetry, and passes through (-2,-1). The circle and the parabola intersect at how many points?

A. 0

B. 1

C. 2

D. 3

Answer: C

Watch Video Solution

28. 40% of 250 is equal to 60% of what number?

A. 150

B. 160

C. $166\frac{2}{3}$

D. 270

Answer: C

Watch Video Solution

29. Which of the following inequalities is equivalent to $-2x - 6y > 2y - 4$?

A. $x < -4y + 2$

B. $x > -4y + 2$

C. $x < 2y + 2$

D. $x < 4y + 2$

Answer: A

Watch Video Solution

30. For an angle with measure α in a right triangle, $\sin\alpha = \frac{40}{41}$ and $\tan\alpha = \frac{40}{9}$. What is the value of $\cos\alpha$?

A. $\frac{9}{41}$

B. $\frac{41}{9}$

C. $\frac{9}{40}$

D. $\frac{9}{\sqrt{.519}}$

Answer: A

View Text Solution

31. The perimeter of rectangle ABCD is 96 cm. The ratio of the side lengths AB : BC is 3:5. What is the length, in centimeters of $\overline{AB}$?

A. 6

B. 18

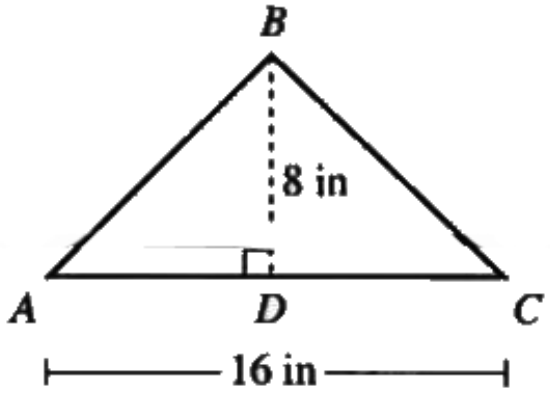
C. 30

D. 36

Answer: B

View Text Solution

32. For $\triangle ABC$ shown below, base $\overline{AC}$ has a length of 16 inches and altitude $\overline{BD}$ has a length of 8 inches. The area of a certain square is equal to the area of $\triangle ABC$. What is the length, in inches, of a side of the square?



A. 6

B. 8

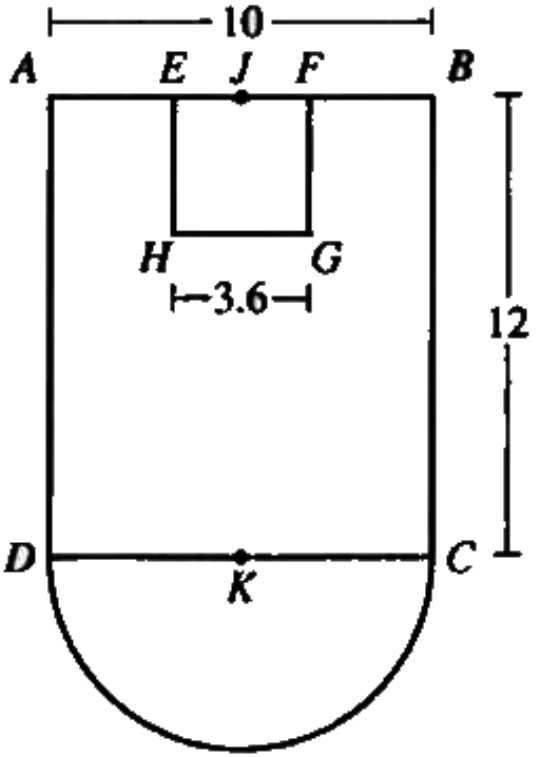
C. 12

D. 16

Answer: B

Watch Video Solution

33. In the figure below, ABCD is a rectangle, EFGH is a square, and $\overline{CD}$ is a diameter of a semicircle. Point K is the midpoint of $\overline{CD}$. Point J is the midpoint of both $\overline{AB}$ and $\overline{EF}$. Points E and F lie on $\overline{AB}$. The 3 given lengths are in meters.



The length of $\overline{EH}$ is what precent of the length of $\overline{AD}$?

A. 0.156

B. 0.3

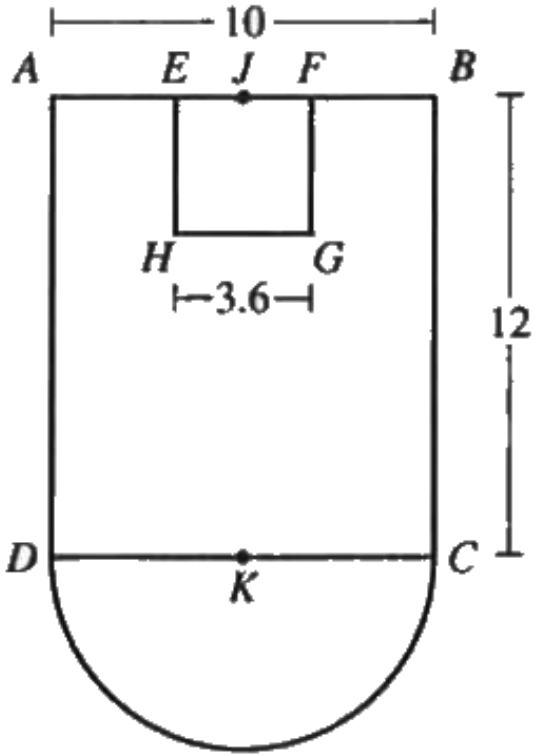
C. 0.36

D. 0.432

Answer: B

Watch Video Solution

34. In the figure below, ABCD is a rectangle, EFGH is a square, and $\overline{CD}$ is a diameter of a semicircle. Point K is the midpoint of $\overline{CD}$. Point J is the midpoint of both $\overline{AB}$ and $\overline{EF}$. Points E and F lie on $\overline{AB}$. The 3 given lengths are in meters.



What is the length, in meters, of $\overline{JD}$?

A. 13

B. 15.6

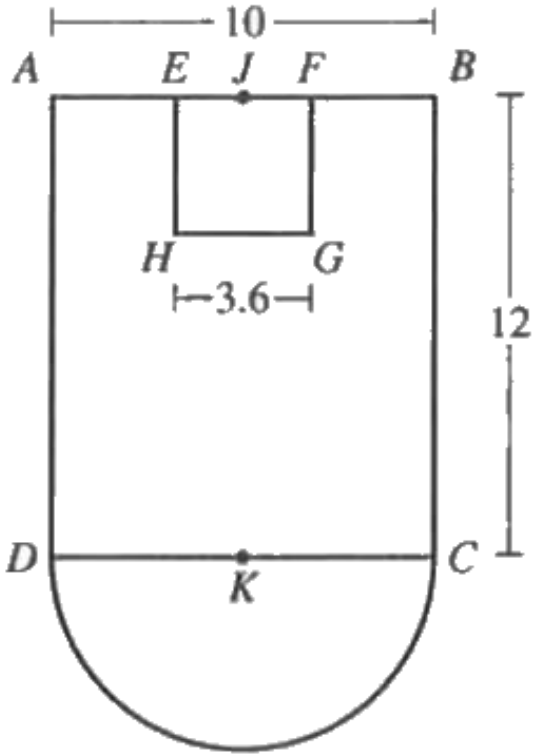
C. 17

D. $\sqrt{44}$

Answer: A

Watch Video Solution

35. In the figure below, ABCD is a rectangle, EFGH is a square, and $\overline{CD}$ is a diameter of a semicircle. Point K is the midpoint of $\overline{CD}$. Point J is the midpoint of both $\overline{AB}$ and $\overline{EF}$. Points E and F lie on $\overline{AB}$. The 3 given lengths are in meters.



What is the length, in meters, of are $\overline{CD}$?

A. 2.5π

B. 5π

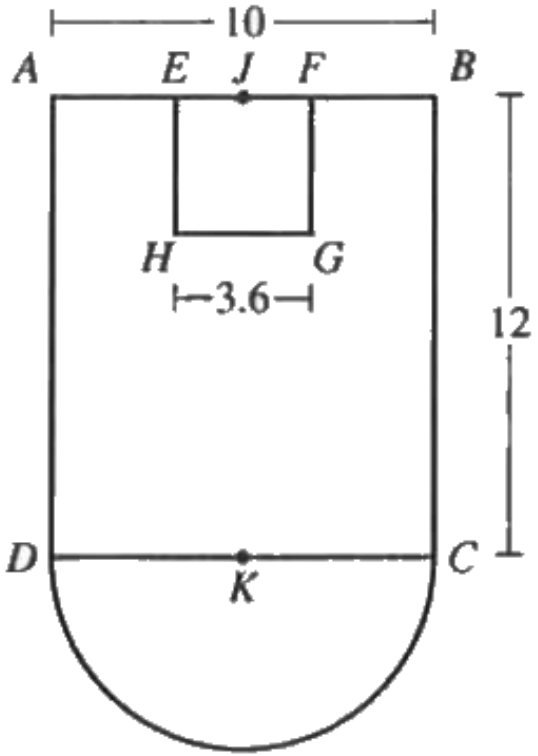
C. 6.25π

D. 10π

Answer: B

Watch Video Solution

36. In the figure below, ABCD is a rectangle, EFGH is a square, and $\overline{CD}$ is a diameter of a semicircle. Point K is the midpoint of $\overline{CD}$. Point J is the midpoint of both $\overline{AB}$ and $\overline{EF}$. Points E and F lie on $\overline{AB}$. The 3 given lengths are in meters.



The figure will be placed in the standard (x,y) coordinate plane so that K is at the origin , $\overline{AB}$ is parallel to the x-axis, and 1 meter equal 1 coordinates unit. Which of the following values could be the y-coordinate of H?

A. 1.8

B. 3.6

C. 8.4

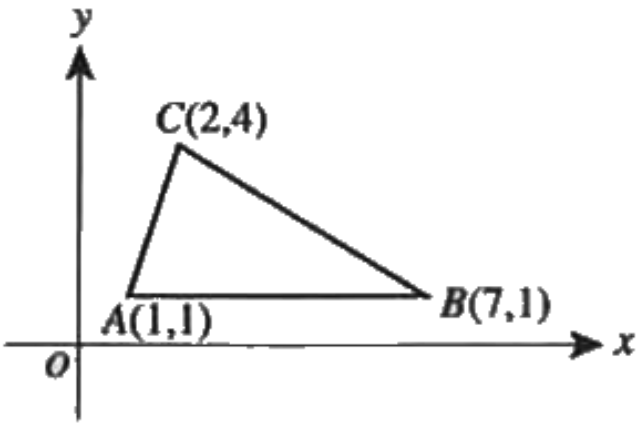
D. 10

Answer: C

Watch Video Solution

37. What is the length in coordinate units, of the altitude from C to $\overline{AB}$ in $\triangle ABC$ shown in the

standard (x,y) coordinate plane below?



A. 3

B. 5

C. 6

D. $\sqrt{10}$

Answer: A

Watch Video Solution

38. At a local post office, on average , 3 customers are in line when the post office closes each day. The probability P, that exactly n customers are in line when the post office closes can be modeled by the equation $P = \frac{3^n e^{-3}}{n!}$. Given that $e^{-3} = 0.05$. Which of the following values is closest to the probability that exactly 2 customers are in line when the post office closes?

A. 0.08

B. 0.11

C. 0.15

D. 0.23

Answer: D

Watch Video Solution

39. What is the amplitude of the function

$f(x) = \frac{1}{2}\cos(3x + \pi)$?

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

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

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

D. 2

Answer: B

Watch Video Solution

40. License plates on cars in a certain state consist of 3 letters taken from the 26 letters. A through Z, followed by 3 digits taken from the 10 digits, 0 through 9. Which of the following expressions gives the number of distinct license plates that are possible given that repetition of both letters and digits is allowed?

A. $10^3 \cdot 26^3$

B. $(10 + 26)^3$

C. $2(26!)^3(10!)^3$

D. $(3 + 3)^{26+10}$

Answer: A

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41. For 20 quiz scores in a typing class, the table below gives the frequency of the scores in each score interval. Which score interval contains the median of the scores?

Score interval	Frequency
96–100	3
91–95	1
86–90	3
81–85	4
76–80	9

A. 96-100

B. 91-95

C. 86-90

D. 81-85

Answer: D

Watch Video Solution

42. In the complex numbers, where $i^2 = -1$.

A. $i - 1$

B. $1 + i$

C. $1 - i$

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

Answer: D

View Text Solution

43. Temperature measured in degrees Fahrenheit (F) are related to temperature measured in degree Celcius (C) by the formula $F = \frac{9}{5}C + 32$. There is 1 value of x for which x degree Fahrenheit equls x degrees Celsius. What is that value?

A. -72

B. -40

C. -32

D. 0

Answer: B

Watch Video Solution

44. The table below gives experimental data value for variables x and y. Theory predicts that y varies directly with x. Based on the experimental data, which of the following value is closest to the constant of variation? (Note : The variable y varies directly with the variable x provided that $y = kx$ for some nonzero constant k.

called the constant of variation.)

x	y
2.75	0.140
8.50	0.425
14.75	0.750
16.75	0.850
21.00	1.050

A. -2.61

B. 0.05

C. 3.61

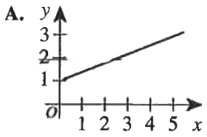
D. 15.9

Answer: B

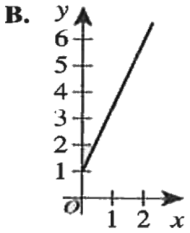
Watch Video Solution

45. During a snowstorm, the relationship between the depth of accumulated snow , y inches, and the elapsed time, x hours, was modeled by the equation $2x - 5y = -5$. One of the following graphs in the standard (x,y) coordinate plane models the equation for positive values of x and y. Which one?

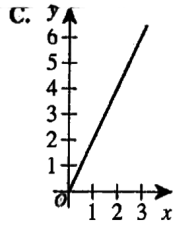
A.



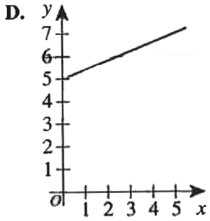
B.



C.



D.



Answer: A

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46. Diana is baking bread, and the original recipe calls for $1\frac{1}{2}$ teaspoons of yeast and $2\frac{1}{2}$ cups of flour. Diana will use the entire contents of a packet that contains $2\frac{1}{4}$ teaspoons of yeast and will use the same ratio of ingredients called for in the orginal recipe. How many cups of flour will Diana use?

A. $1\frac{7}{8}$

B. $3\frac{1}{4}$

C. $3\frac{1}{2}$

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

Answer: D

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47. For all nonzero values of x, $\dfrac{12x^6 - 9x^2}{3x^2} = ?$

A. $4x^3 - 3x$

B. $4x^3 - 3$

C. $4x^4 - 9x^3$

D. $4x^4 - 3$

Answer: D

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48. Four matrices are given below.

$$W = \begin{bmatrix} 1 & 2 \\ 5 & 8 \end{bmatrix} X = \begin{bmatrix} 3 & 9 \\ 7 & 4 \end{bmatrix} Y = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 6 \end{bmatrix} Z = \begin{bmatrix} 5 & 8 \\ 2 & 9 \\ 3 & 7 \end{bmatrix}$$

Which of the following matix products is undefined?

A. WX

B. WY

C. YZ

D. XZ

Answer: D

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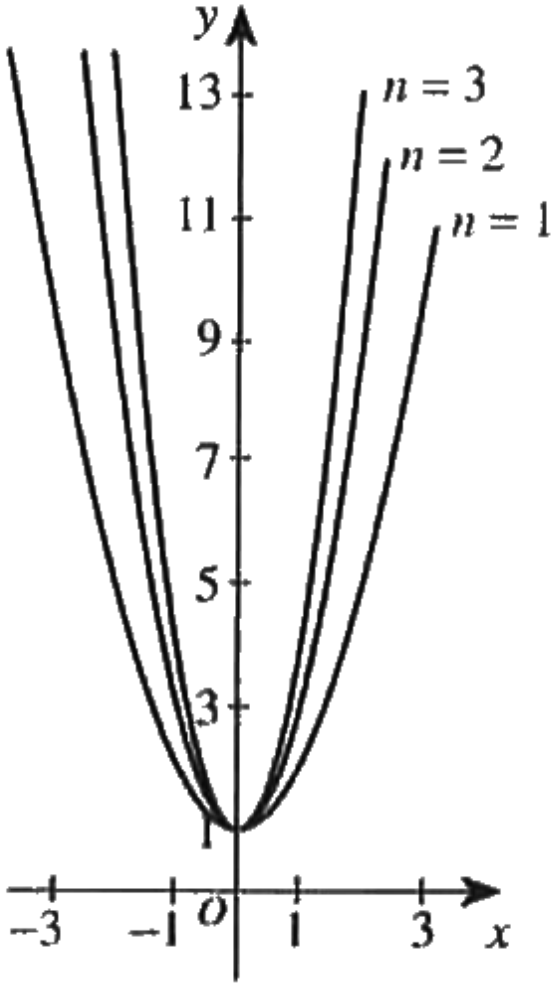
49. The 3 parabola graphed in the standard (x,y) coordinate plane below are from a family of parabolas. A general equation that defines this family of parabolas contains the variable n in addition to x and y. For one of the parabolas shown , n = 1, for following could be a general equation that defines this family of

parabolas for all $n \geq 1$?



A. $y = nx^2 + 1$

B. $y = \frac{1}{n}x^2 + 1$

C. $y = x^2 + n$

D. $y = -nx^2 + 1$

Answer: A

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50. After polling a class of 20 music students by a show of hands, you find that 8 students play the guitar and 9 students play the piano. Given that information, what is the minimum number of students in this music class who play both the guiter and the piano?

A. 0

B. 1

C. 8

D. 17

Answer: A

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51. A teacher assigns each of her 18 students a different interger from 1 through 18. The teacher forms pairs of study partners by using the rule that the sum of the pair of numbers is a perfect square. Assuming the 9 pairs of students follow this rule, the

student assigned which number must be paired with the student assigned the number 1?

A. 16

B. 15

C. 9

D. 8

Answer: B

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52. Lucky found $8.25 in pennies, nickels, dimes, and quarters while walking home from school one week.

When she depostied this money in the bank, she noticed that she had twice as many nickels as pennies, 1 fewer dime than nickels, and 1 more quarter than nickels. How many quarters did Lucky find that week?

A. 3

B. 9

C. 16

D. 21

Answer: D

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53. Given $10^{\frac{2x-1}{x}} = 1, x = ?$

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

B. $-\frac{1}{8}$

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

D. $\frac{10}{19}$

Answer: C

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54. The table below shows the results of a survey of 250 people who were asked whether they like to read

and whether they play a musical instrument.

	Play a musical instrument	Do NOT play a musical instrument	Total
Like to read	50	60	110
Do NOT like to read	40	100	140
Total	90	160	250

According the the results, what is the probability that a randomly selected person who was surveyed likes to read, given that the person plays a musical instrument?

A. $\frac{1}{5}$

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

C. $\frac{5}{11}$

D. $\frac{9}{25}$

Answer: B

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55. Mario was ridiing a bicycle with wheels 26 inches in diameater, During 1 minute of Mario's ride, the wheels mase exactly 200 revolutions. At what average speed, in feet per second, was Mario riding during that mintue?

A. $\frac{65}{9}\pi$

B. $\frac{65}{18}\pi$

C. $\frac{130}{9}\pi$

D. $\frac{845}{18}\pi$

Answer: A

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56. Whenever j and k are positive integers such that $(\sqrt{3})^j = 27^k$, what is the value of $\frac{j}{k}$?

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

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

C. 3

D. 6

Answer: D

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57. A finite arithmetic sequence has 7 terms, and the first term is $\frac{3}{4}$. What is the difference between the mean and the median of the 7 terms?

A. 0

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

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

D. 3

Answer: A

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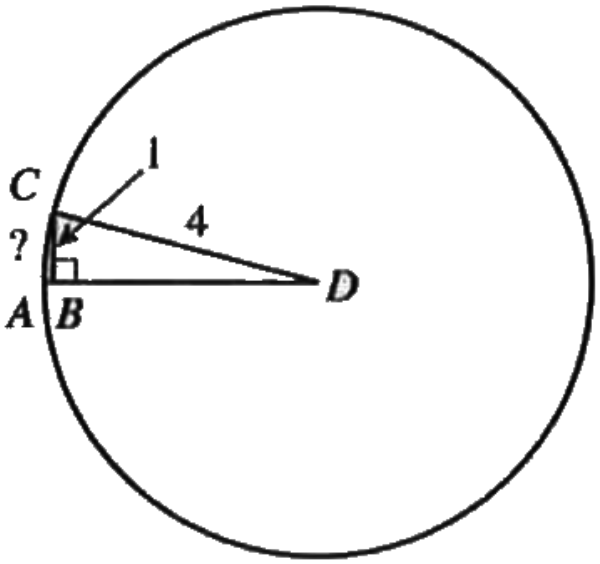
58. In the circle with center D shown below, the length of radius $\overline{CD}$ is 4 cm, the length of $\overline{BC}$ is 1 cm, and $\overline{BC}$ is perpendicular to radius $\overline{AD}$ at B. When $\angle ADC$ is measured in degree, which of the following expressions represents the length, in centimeters, of $\overline{AC}$?



A. $\frac{\pi}{45}\left(\sin^{-1}\left(\frac{1}{4}\right)\right)$

B. $\frac{\pi}{45}\left(\cos^{-1}\left(\frac{1}{4}\right)\right)$

C. $\frac{2\pi}{45}\left(\sin^{-1}\left(\frac{1}{4}\right)\right)$

D. $\frac{2\pi}{45}\left(\cos^{-1}\left(\frac{1}{4}\right)\right)$

Answer: A

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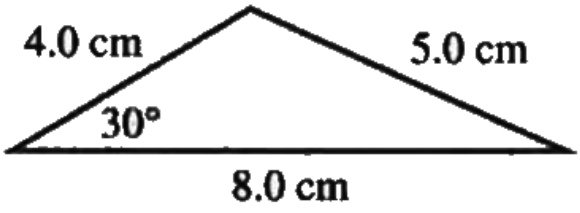
59. The lengths of the triangle shown below are rounded to the nearest 0.1 cm. What is the area, to the nearest $1cm^2$ of the triangle?



Note: The area of any triangle with sides of length a, b and c opposite angle of measure A, B, and C, respectively, is given by $\frac{1}{2}ab\sin C$.

A. 4

B. 5

C. 8

D. 10

Answer: C

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60. The probability distribution of the discrete random variable X is shown in the table below. What is the

expected value of X?

x	Probability $P(X = x)$
0	$\frac{1}{6}$
1	$\frac{1}{12}$
2	$\frac{1}{4}$
3	$\frac{1}{12}$
4	$\frac{1}{12}$
5	0
6	$\frac{1}{3}$

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

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

C. 1

D. $3\frac{1}{6}$

Answer: D

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