MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

PRACTICE TEST 2

Multiple Choice

1. $\frac{5x-3y}{3x+5y}+\frac{2}{3}=1$

In the equation above,what is the value of $\frac{x}{y}$?

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

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

C. $\frac{5}{6}$

D. $\frac{7}{6}$

Answer: D

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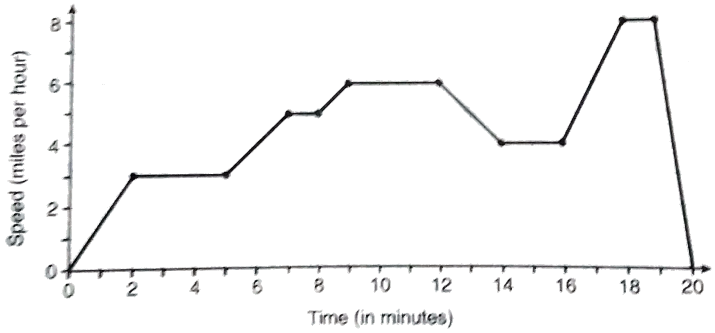

2.

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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3. In the figure above, $\overline{AB} \parallel \overline{CD}$, AD=42, AB=12, and CD=16, what is the length of $\overline{DE}$?

A. 21

B. 24

C. 27

D. 30

Answer: B

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4. $C = 60 + 0.25d$

The equation represents the monthly cost of a cell phone that includes up to 1 gigabyte of data after which there is a charge for d gigabytes of any additional data. Which of the

following must be true?

I. The cost of each additional megabyte of data is $60.25.

II. The y-intercept of the graph of the cost equation represents the charge for each additional megabytes of data used.

III. If betwee 5 and 6 megabytes of data are used in month, the monthly charge is $61.25.

A. I and II only

B. I and III only

C. II only

D. III only

Answer: D

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5. Fow what set of values of x is the expression

$|3x + 4| < 0$ true?

A. $-\frac{4}{3} < 0 < x$

B. $x < \frac{-4}{3}$

C. No real numbers

D. All real number

Answer: C

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6. The distance a free falling object has traveled can be modeled by the equation, $d = \frac{1}{2}at^2$ where a is acceleration due to gravity and t is the amount of time the object has fallen. What is t in terms of a and d?

A. $t = \sqrt{\frac{da}{2}}$

B. $t = \sqrt{\frac{2d}{a}}$

C. $t = \left(\frac{da}{2}\right)^2$

D. $t = \left(\frac{3d}{a}\right)^2$

Answer: B

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7. If $x^2 - y^2 = 24$ and $x - y = 3$, what is the value of y?

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

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

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

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

Answer: D

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8. If $\frac{z}{2b} = 4, \frac{z}{3c} = 6,$ and $2b + 3c = 12,$ what is the value of z?

A. 16

B. 20

C. 24

D. 48

Answer: C

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9. A pizza has a fixed initial cost of $180,000 and a variable cost of $4 for each pizza sold. If the pizza parlor charges $10 for each pizza,

how many pizzas will it have to sell before it makes a profit?

A. $24,000$

B. $30,000$

C. $38,000$

D. $42,000$

Answer: B

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10.

$(ax + 7)(bx - 1) = 12x^2 + kx + (b - 13)$

If the equation above is true for all values of x where a, b, and k are non-zero constants, what is the value of k?

A. 40

B. 25

C. 17

D. 8

Answer: A

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11. Function f is defined by the equation $f(x) = ax^2 + \frac{2}{a}x$. If $f(3) - f(2) = 1$, what is the smallest possible value of a?

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

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

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

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

Answer: B

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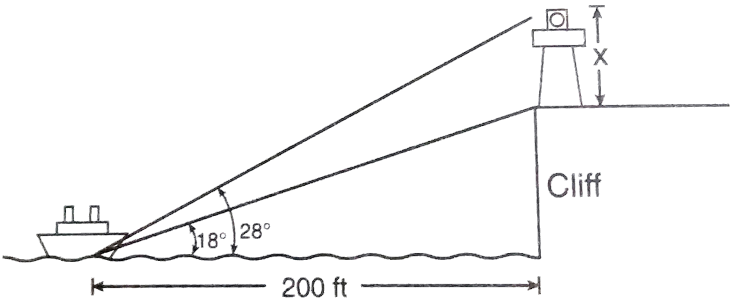
12.



A lighthouse is built on the edge of a cliff near the ocean, as shown in the diagram above. From a boat located 200 feet from the base of the cliff, the angle of elevation to the top of the cliff is 18° and the angle of elevation to the top of the lighthouse is 28°. Which of the

following equations could be used to find the height of the lighthouse, x, in feet?

A. $x = 200\tan 10^\circ$

B. $x = 200(\tan 28^\circ - \tan 18^\circ)$

C. $x = \dfrac{200}{\tan 28^\circ - \tan 18^\circ}$

D. $x = 200\left(\dfrac{\tan 18^\circ}{\tan 28^\circ}\right)$

Answer: B

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13. The local deli charges a fee for delivery. On Monday, they delivered two dozen bagels to an office at a total cost of $8. On Tuesday, three dozen bagels were delivered at a total cost of $11. Which system of equations could be used to find the cost of a dozen bagels, b, if the delivery fee is f?

A. $b + 2f = 8$

$b + 3f = 11$

B. $2b + f = 8$

$b + 3f = 11$

C. $b + 2f = 8$

$3b + f = 11$

D. $2b + f = 8$

$3b + f = 11$

Answer: D

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14. The equation of a parabola in the xy-plane is $y = 2x^2 - 12x + 7$. What is the distance between the vertex of the parabola and the point $(3, 4)$?

A. 6

B. 8

C. 11

D. 15

Answer: D

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15. When a base ball by a batter, the height of the ball, h(t), at time t, is determined by the equation $h(t) = -16t^2 + 64t + 4$, where $t \geq 0$. For which interval of time, in seconds, is the height of the ball at least 52 feet above the playing field?

A. $0.5 \leq t \leq 2.5$

B. $1.0 \leq t \leq 3.0$

C. $1.5 \leq t \leq 3.5$

D. $2.0 \leq t \leq 4.0$

Answer: B

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16. $\dfrac{\frac{2}{3}a^2 - \frac{4}{9}a^2}{2a} = 4$ where $a \neq 0$

What is the value of a in the expression above,

A. 28

B. 42

C. 36

D. 12

Answer: C

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17. $\frac{2}{3}x - \frac{1}{4}y = 6$

$kx - \frac{1}{3}y = 8$

If the system of equations above has an infinite number of solutions, what is the value of the constant k?

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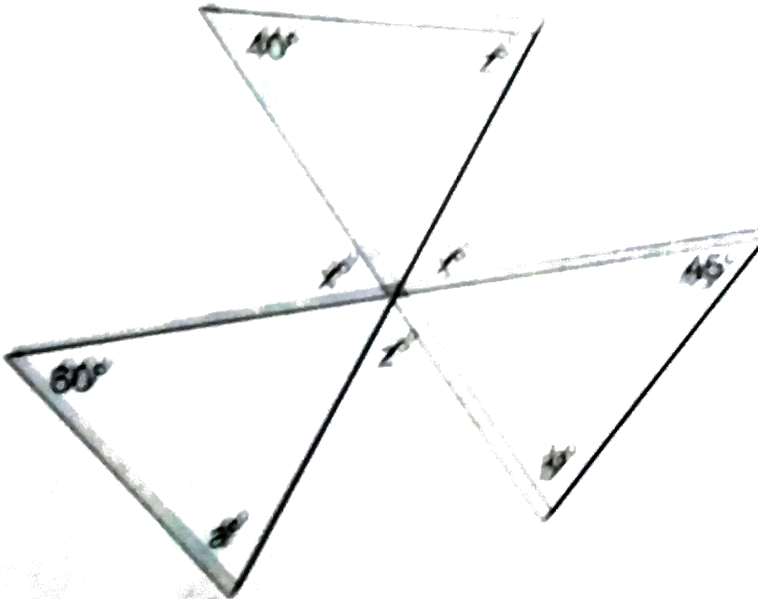
18. 

In the figure above, the measures of the angles are as marked. What is the value of a+b?

A. The equation $W = 120I - 12i^2$ represents the power, W, in watts, of a

120-volt circuit having a resistance of 12 ohms when current, I, is flowing through the circuit. What is the maximum power, in watts, that can be delivered in this circuit?

B.

C.

D.

Answer: A::D

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19. The equation $W = 120I - 12i^2$ represents the power, W, in watts, of a 120-volt circuit having a resistance of 12 ohms when current, I, is flowing through the circuit. What is the maximum power, in watts, that can be delivered in this circuit?

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20. The graph of a line in the xy-plane passes through the points (5, -5) and (1, 3). The graph of a second line has a slope of 6 and passes though the point (0, 1). If the two lines intersects at (p, q), what is the value of p+q?

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21. If three times 1 less than a number n is the same as two times the number increased by 14, what is the value of n?

A. 15

B. 17

C. 19

D. 21

Answer: B

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22. George spent 25% of the money he had on lunch and 60% of the remaining money on

dinner. If he then had $9.00 left, how much money did he spend on lunch and dinner?

A. $19

B. $20

C. $21

D. $27

Answer: C

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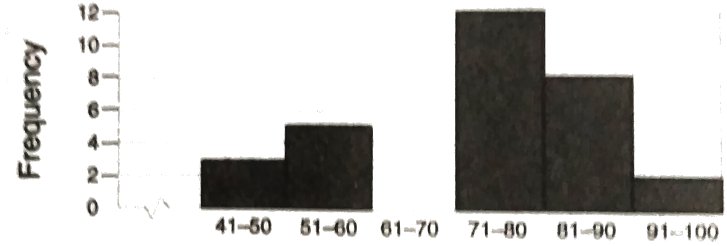
23. 

The histogram above shows the distribution of 30 test scores. If test score is selected at random, what is the probability that the score falls in the interval that contains the median score?

A. $\frac{4}{15}$

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

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

D. $\frac{3}{5}$

Answer: B

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24. The breakdown of a 500-milligram sample of a chemical compounds in the bloodstream is represente by the function $p(n) = 500(0.8)^n$, where p(n) represents the number of milligrams of the compound that remains at the end of n hours. Which of the

following is true?

I. The amount of the compound present is decreasing by a constant amount.

II. Each hour the compound gets reduced by 20% of the amount present at the beginning of that hour.

III. Each hour the compound gets reduced by 80% of 500.

A. I only

B. II only

C. I and III only

D. II and III only

Answer: B

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25. Maggie's farm stand sold total of 165 pounds of apples and peaches. She sold apples for $1.75 per ground and peaches for $2.50 per pound. If she made $337.50, how many pounds of peaches did she sell?

A. 11

B. 18

C. 65

D. 100

Answer: C

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26.

Number of Weeks	1	2	3	4
Number of Downloads	120	180	270	405

A computer program application developer released a new game app to be downloaded.

The table above gives the number downloads, y, for the first four weeks after the launch of the app. If w represents the number of weeks after the launch of the app, which equation best models these data?

A. $y = 60(w + 1)$

B. $y = 96(1.25)^w$

C. $y = 80(1.50)^w$

D. $y = 90w$

Answer: C

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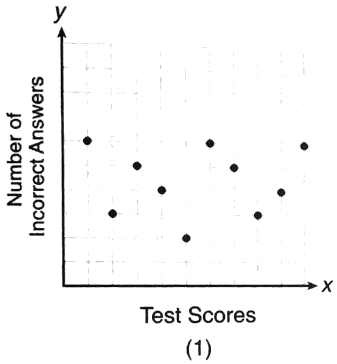

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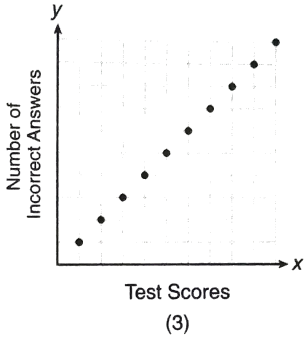

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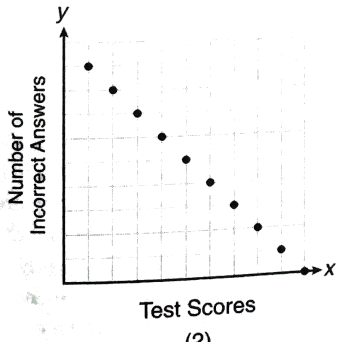

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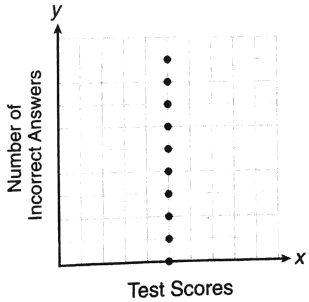

(4)

27. Which of the four graphs above best shows the relationship between x and y if x represents a student score on a test and y

represents the number of incorrect answers a student received on the same test?

A. Graph (1)

B. Graph (2)

C. Graph (3)

D. Graph (4)

Answer: B

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28. An animal boading facility houses 3 dogs for every 2 cats. If the combined total of dogs and cats the boarding facility is 250, how many cats are housed?

A. 80

B. 100

C. 120

D. 150

Answer: B

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29. An airline flies, two different planes over the same route. The faster of the two planes travels at an average speed of 540 mile per hour,and the other plane travels at an average speed of 450 miles per hour. How many more miles can the faster plane travel in 12 seconds than the slower plane?

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

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

C. 9

D. 18

Answer: B

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30. $x - 3y = 2y + 7$

$x + 2 = 3(y + 1)$

In the above system of equations, what is the value of $\frac{x}{y}$?

A. $\frac{8}{3}$

B. $\frac{11}{3}$

C. 4

D. 12

Answer: A

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31. An Ironman Triathlon consist of swimming 2.4 miles, biking 112 miles,and running a marathon distance of 28.2 miles. Dylan

completed an Ironman Triathlon in 12 hours and 30 minutes. He spent approximately half the time biking. He needed hour 4 times as much time to run the 26.2 miles as to swim the 2.4 miles. The average rate of minutes per mile at which Dylan ran the marathon part of the triathlon is closest to which of the following

A. 10.6

B. 11.5

C. 12.2

D. 13.4

Answer: B

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32. The bottom of a ske slope is 6,500 feet above sea level,the top of the slope is 11,000 feet above sea level, and the slope drops 5 feet vertically for every 11 feet traveled in the horizontal direction. From the top of the slope, Kayla skis down at an average speed of 30 miles per hour. Which of the following function gives the best estimate for the

distance above sea level, d, Kayla is t seconds after she begins her ski run where $6,500 < d < 11,000$?

A. $d(t) = 11,000 - \left(\frac{150}{11}\right)t$

B. $d(t) = 11,000 - 2.2t$

C. $d(t) = 11,000 - 20t$

D. $d(t) = 4,500 - 1,200t$

Answer: C

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33. A gardener is planting two types of trees. One type is seven feet tall and grows at a rate of 8 inches per year. The other type is four feet tall and its rate of the growth is 50% greater than the rate of the other tree. In how many years will the two grow to the same height?

A. 6

B. 7

C. 8

D. 9

Answer: D

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34.

	Vaccination and Flu Status				
Age	Unvaccinated No Flu	Unvaccinated Got Flu	Vaccinated No Flu	Vaccinated Got Flu	Total
Under 21	6	4	8	2	20
21–50	17	15	22	14	68
Over 50	2	9	32	19	62

The table above summarizes the result of a survey taken at the end of last year's flu seson. What fraction of the people who got the flu were unvaccinnated?

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

B. $\frac{4}{9}$

C. $\frac{3}{8}$

D. $\frac{1}{12}$

Answer: B

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35. The temperature, t, generated by an electrical circuit is represented by $t = f(m) = 0.3m^2$, where m is the number of moving parts. The resistance of the same

circuits is represented by $r = g(t) = 150 + 5t,$ where t is the temperature. What is the resistance in a circuit that has four moving parts?

A. 51

B. 156

C. 174

D. $8, 670$

Answer: C

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36.

Comparison of Combined State and Local Spending on Education						
	Year					
	2011		2013		2015	
State	Education Spending	Population	Education Spending	Population	Education Spending	Population
California	453,480.7	37.7	447,531.1	38.4	454,003.1	39.2
New York	300,031.9	19.5	306,395.8	19.7	316,104.0	19.8
Texas	221,155.9	25.7	226,805.0	26.5	252,655.5	27.4
Florida	163,070.8	19.1	157,010.2	19.6	162,548.3	20.2
Illinois	129,543.3	12.9	132,848.8	12.9	140,072.6	12.9

Question 16 and 17 refer to the above table, that shows the population (in millions) and education spending (in millions) and by state for each of the states listed for the years 2011, 2013, and 2015.

Q. Which of the following best approximates the average rate of change in education spending in Texas from 2011 to 2015?

A. 3.2 billion per year

B. 6.3 billion per year

C. 10.5 per year

D. 7.9 billion per year

Answer: D

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37.

Comparison of Combined State and Local Spending on Education						
	Year					
	2011		2013		2015	
State	Education Spending	Population	Education Spending	Population	Education Spending	Population
California	453,480.7	37.7	447,531.1	38.4	454,003.1	39.2
New York	300,031.9	19.5	306,395.8	19.7	316,104.0	19.8
Texas	221,155.9	25.7	226,805.0	26.5	252,655.5	27.4
Florida	163,070.8	19.1	157,010.2	19.6	162,548.3	20.2
Illinois	129,543.3	12.9	132,848.8	12.9	140,072.6	12.9

Question 16 and 17 refer to the above table, that shows the population (in millions) and education spending (in millions) and by state for each of the states listed for the years 2011, 2013, and 2015.

Q. Based on the data in the table,which of the following must be true?

I. In 2015 per capita (per person) spending on education inn illinois was greater than per

capita spending on education in Texas.

II. Per capita spending on education in Florida declined in 2015 compared to 2011 spending.

III. California had the highest per capita spending in education for each year.

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

Answer: A

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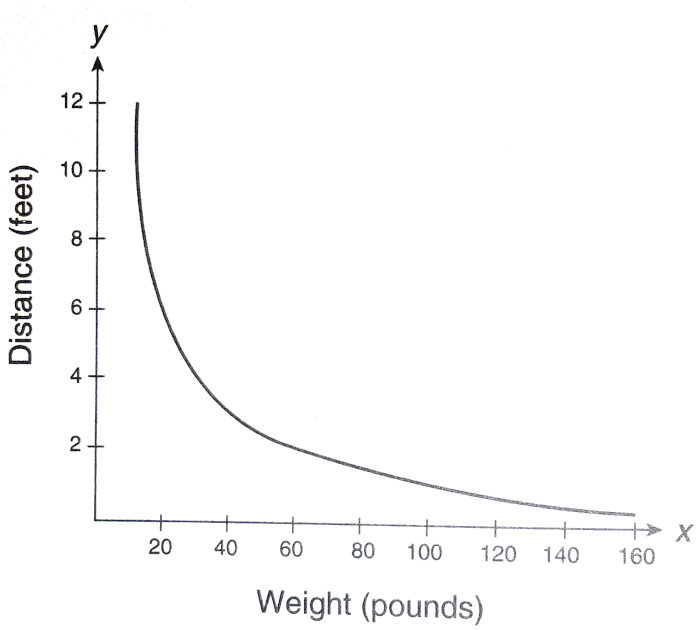

38.

The graph above shows the relationship between a person's weight and the distance that the person must sit from the center of seesaw to make it balanced. Which of the

following best represents the equation of this graph?

A. $y = 12x^2$

B. $y = -120x$

C. $y = 120\left(\frac{1}{2}\right)^x$

D. $y = \frac{120}{x}$

Answer: D

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39.

Average Annual Salary Range By Highest Level of Degree Earned				
Highest Degree Earned	Average Annual Salary			
	Less than $35,000	$35,000 to $70,000	More than $70,000	Total
High School	21	15	3	39
Two Year College	12	24	2	33
Four Year College	18	41	29	93
Graduate School	1	28	46	75
Total	52	108	80	240

The table above summarizes the result of a survey taken in which 240 adults were asked about their education level and current annual salary. If a participant who reported earning $35,000 or more per year is selected at

random, what is the best estimate of the probability that the person does not have a graduate school degreee?

A. 0.31

B. 0.40

C. 0.60

D. 0.69

Answer: C

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40. If the sum of 10 dimes, 5 nickels and x quarters equals $5.25, what is the value of x?

A. 8

B. 10

C. 16

D. 22

Answer: C

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41.

Students at Washington High School	Male	Female	Total
Taking AP Classes	56	72	128
Not Taking AP Classes	23	26	49
Total	79	98	177

The table above gives the number of male and female students at Washington High School who are taking Advanced Placement (AP) classes and those who are not. What is the proportions of the total number of students at the school who are both male and NOT taking AP classes?

A. $\frac{23}{177}$

B. $\frac{79}{177}$

C. $\frac{23}{49}$

D. $\frac{23}{56}$

Answer: A

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42. A travel agency sells ship cruises for a popular cruises line. Historically, 135 cruises can be sold when the price is $950 per person.

If the price drops to the minimum allowed by the cruises line of $725 per person, 180 cruises can be sold. If the number of cruises sold increase at a constant rate as the price p decrease, where $p \geq 725$, which of the following functions best models the situation described?

A. $f(p) = -\frac{1}{29}p + 205$

B. $f(p) = -\frac{1}{19}p + 1,135$

C. $f(p) = -5p + 4,885$

D. $f(p) = -\frac{1}{5}p + 325$

Answer: D

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43. I. The coordinate of the center are (2, -3).

II. The coordinate of the center are (-2, 3).

III. The length of the radius is $5\sqrt{2}$.

IV. The length of the radius is 50.

Q. If an equation of a circle is $x^2 + 4y + y^2 - 6y = 37$, which of the statements above are true?

A. I and III

B. I and IV

C. II and III

D. II and IV

Answer: C

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44. $f(x) = \dfrac{x^4 + 2x^3 - 3x^2 + 4x + 12}{x + 3}$

Which of the following functions is equivalent

to the functions above for all values of x for which function above for all values of x for which function f is defined?

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

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

C. $g(x) = x^3 - x^2 + 4x$

D. $g(x) = x^4 + 2x^3 - 3x^2 + 4$

Answer: A

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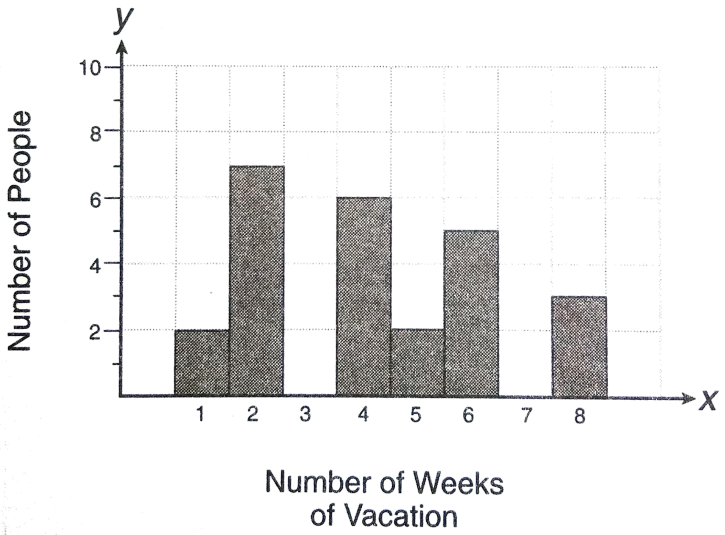

45.

The histogram above shows the result of a survey taken of 25 individuals who were polled about how many weeks of vacation per year they receive. Which of the following is closest to the average (arithmetic mean) number of weeks of vacation per individual?

A. 2

B. 3

C. 4

D. 5

Answer: C

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46. If p(x) is a polynomial function and p(-1)=3, which statement is true?

A. The remainder when p(x) is divided by x-3 is -1.

B. The remainder when p(x) is divided by x+3 is -1.

C. The remainder when p(x) is divided by x-1 is 3.

D. The remainder when p(x) is divided by x+1 by 3.

Answer: D

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47. $y = \frac{3}{h-2}x + 5$

$hy - 8x = 5$

For what value of h does the system of equations above have no solution?

A. $\frac{16}{5}$

B. $\frac{13}{8}$

C. $\frac{11}{15}$

D. $\frac{5}{8}$

Answer: A

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48. A troy ounce is a unit of mass used for precious metals such as gold. There are 12 troy ounces in a troy pound and a troy pound is equivalent to 373.3 grams. If the density of gold is 19.3 grams per cubic centimeter, which of the following is closest to the number of cubic centimeters in the volume of block of gold with mass of 5 troy ounces? [Note: density is mass divided by volume]

A. 7

B. 8

C. 9

D. 10

Answer: B

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49. A resrearcher is conducting a survey for which she currently has 93% confidence level. What would be two actions that she could

take that would be most likely to increase the confidence level in her survey result?

A. Increase the sample size and modify the design of the survey to increase the standard deviation.

B. Increase the sample size and modify the design of the survey to decrease the standard deviation.

C. Decrease the sample size and increase the randomness of the survey sample.

D. Modify the design of the survey to increase the standard deviation and decrease the randomness of the survey sample.

Answer: B

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50. The coordinate of the vertex of a parabola in the xy-plane are $(-4, k)$. If the y-intercepts of the parabola is 12 and the parabola passes

through the point $(-3, 7)$,what is the value of k?

A. $\frac{20}{3}$

B. $\frac{16}{5}$

C. $\frac{14}{3}$

D. $\frac{12}{5}$

Answer: A

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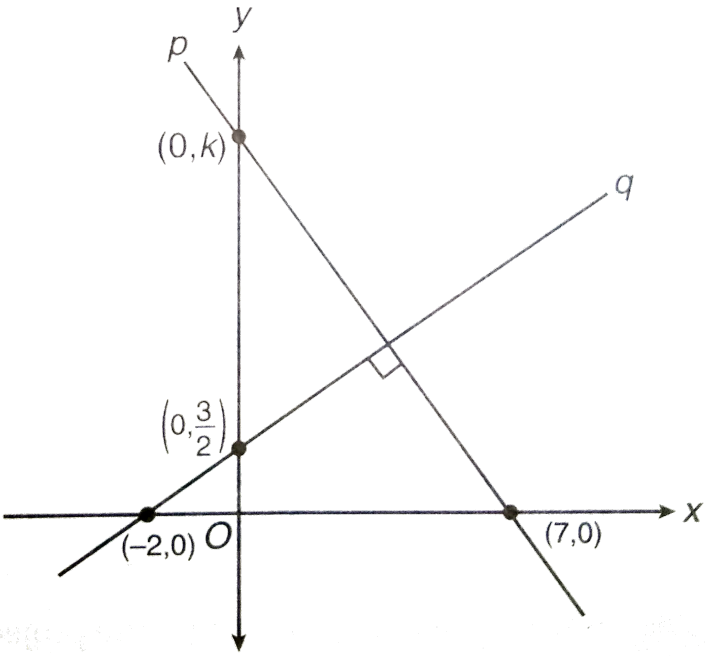

51.

In the xy-plane above, line p is perpendicular to line q. What is the value of k?

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52. Even seconds after a deep sea diver jumps into the ocean he is 69 feet below sea level and 28 seconds later, he is 195 feet below sea level. If he is descending under water at a constant rate, how many feet below sea level will he be 1.5 minutes after his initial descent?

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53. What is a possible value of x that satisfies

$9 < 4x - |-3| < 10$

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54. One way of estimating wildlife population of interest is to draw a sample of the population, tag the animals, and then return them to the population. Then, at a later date, draw another sample at random from the same population and compare the results. An ecologist using this methodology captures, tags, and then returns 198 fish to a lake. Three months later the ecologist captures a sample of 135 of the same type of fish, of which 22

were tagged. What would be the ecologist's best estimate for the number of fish of that type that are in the lake?

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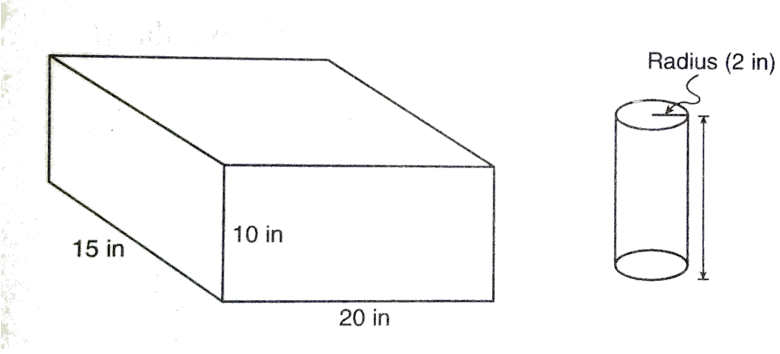
55.



In the figure above, a rectangular container with the dimensions 10 inches by 15 inches by 20 inches is to be filled with water, using a

cylindrical cup whose radius is 2 inches and whose height is 5 inches. What is the maximum number of full cups of water that can be placed into the container without the water overflowing the container?

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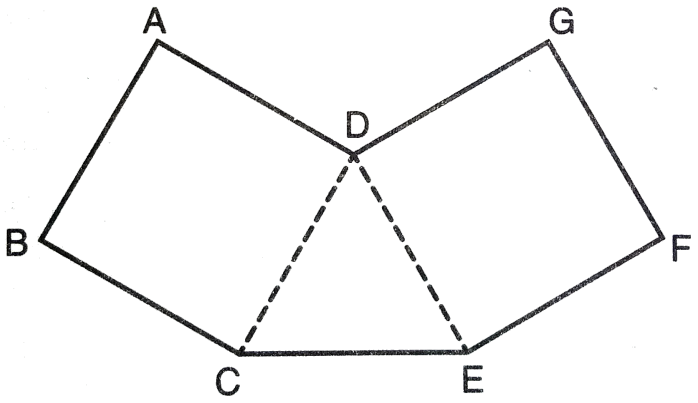

56.

A sterling silver pendant is being designed to have the shape of polygon ABCDEFGD shown above where ABCD and EFGD are squares and triangle CDE is equilateral. If the area of $\triangle CDE$ is $\frac{27}{\sqrt{3}}$ square centimeter, what is the total linear distance around the pendant?

Watch Video Solution

57. Questions 37 and 38 refer to the following information.

$h(t) = -4.9t^2 + 88.2t$

When a projectile is launched from ground level, the equation above gives the number of meters in its height, h, after t seconds have elapsed.

Q. How many seconds after the projectile is launched will it hit the ground?

Watch Video Solution

58. Questions 37 and 38 refer to the following information.

$h(t) = -4.9t^2 + 88.2t$

When a projectile is launched from ground level, the equation above gives the number of meters in its height, h, after t seconds have elapsed.

Q. What is the maximum height the projectile reaches, correct to the nearest meter?

Watch Video Solution

Exercise

1. A restaurant occupying the top floor of a skyscaper rotates as diners enjoy the view. Ling and Sarah notice that they began their meal at 7:00 p.m. Looking due north. At 7:45 p.m. they had ratated 180° to a view that was due south. At this rate, how many degrees will degrees will be restaurent rotate in 1 hour?

A. 90°

B. 180°

C. 240°

D. 270°

Answer: C

Watch Video Solution

2. The cost of a gym membership is a onetime fee of $140, plus a monthly fee of $ 40. Brendan wrote a $500 check to pay his gym membership for a certain number of months, including the onetime fee. How many months of membership did he pay for?

A. 3

B. 4

C. 9

D. 12

Answer: C

 Watch Video Solution

3. A musems offers a 2-hour guided tour. For groups with fewer than 25 people the cost is $9.25 per person, for groups with 25 people or

more the cost is $8.50 per person. The 27 people in the 9.00 a.m. tour group each paid $ 9.25 in advance. What is the total refund that the museum owes the 9:00 a.m. group?

A. $12.50

B. $13.00

C. $ 18.75

D. $ 20.25

Answer: D

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4. The 13-member math club needs to choose a student government representative. They decide that the representative, who will be chosen at random, CANNOT be any of the 3 officers of the club. What is the probability that Samara, who is a member of club but NOT an officer, will be chosen?

A. 0

B. $\frac{1}{13}$

C. $\frac{1}{10}$

D. $\frac{3}{13}$

Answer: C

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5. Mela earned scores of 75, 70, 92, 95 and 97 points (a total of 429 points) on the first 5 tests in Economics II. Solving which of the following equations for s gives the score he needs to earn on the 6th test to average exactly 85 points for all 6 tests?

A. $\frac{429}{5} + s = 85$

B. $\frac{429}{6} + s = 85$

C. $\frac{s + 429}{5} = 85$

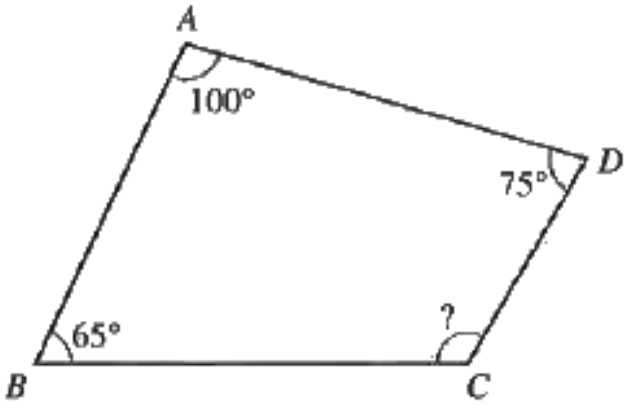
D. `(s + 429)/6 = 85

Answer: D

Watch Video Solution

6. The figure below shows quadrilateral ABCD.

What is the measure of $\angle C$?



A. 120°

B. 115°

C. 105°

D. 100°

Answer: A

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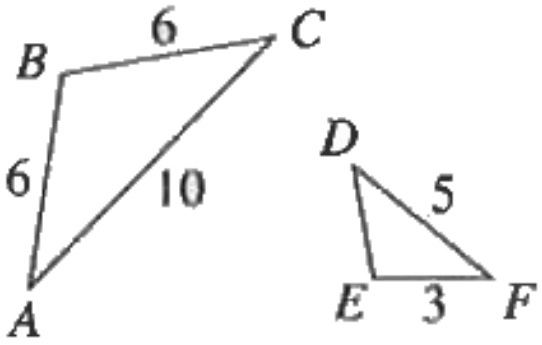
7. In the figure below, $\triangle ABC$ and $\triangle DEF$ are similar triangles with the given side lengths in meters. What is the perimeter, in meters, of $\triangle DEF$?



A. 3

B. 8

C. 11

D. 12

Answer: C

Watch Video Solution

8. $|3(-2)+4| = ?$

A. -2

B. 2

C. 5

D. 9

Answer: B

Watch Video Solution

9. What are the values for x that satisfy the equation $(x + a)(x + b) = 0$?

A. $-a \text{ and } -b$

B. $-a \text{ and } b$

C. $-ab$

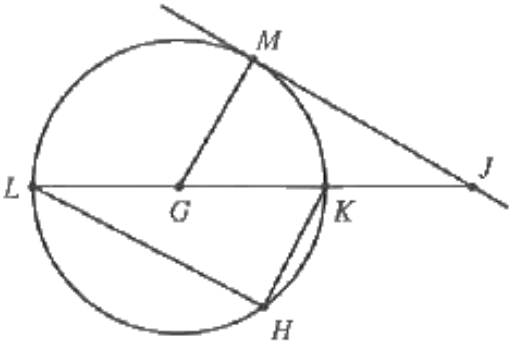
D. a and $-b$

Answer: A

Watch Video Solution

10. In the figure below, G is the center of the circle, $\overline{LK}$ is a diameter, H lies on the circle, J lies outside the circle on $\overline{LK}$ and $\overline{JM}$ is tangent to the circle at M. Which of the following angles or minor area has the

greatest degree measure?



A. $\overline{LM}$

B. $\overline{MK}$

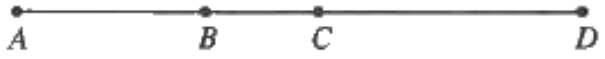
C. $\angle JMG$

D. $\angle LHK$

Answer: A

Watch Video Solution

11. Points B and C lie on $\overline{AD}$ as shown below. The length of $\overline{AD}$ is 30 units, $\overline{AC}$ is 16 units long, and $\overline{BD}$ is 20 units long. How many units long, if it can be determined, is $\overline{BC}$?



A. 4

B. 6

C. 10

D. 14

Answer: B

Watch Video Solution

12. If $12x = -8(10 - x)$, then x = ?

A. 20

B. 8

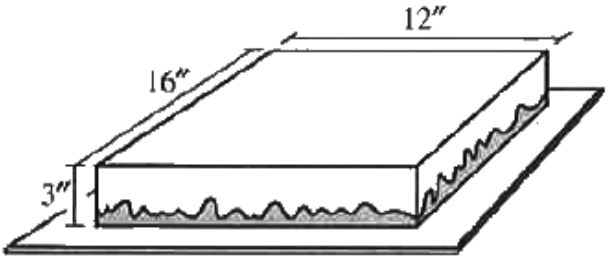
C. $7\frac{3}{11}$

D. -20

Answer: D

Watch Video Solution

13. Ken baked, frosted, and decorated a rectangular cake for the last Math Club meeting. The cake was 3 inches high, 12 inches wide, and 16 inches long. He centrated the cake on a piece of carboard whose rectangular top surface had been covered with aluminum foil, as shown in the figure below.



Ken used a piece of cardboard large enough to allow the cardboard to extend 2 inches beyond the cake on all sides. What is the area, in square inches, of the aluminum foil that is exposed on the top surface of the cardboard?

A. 60

B. 64

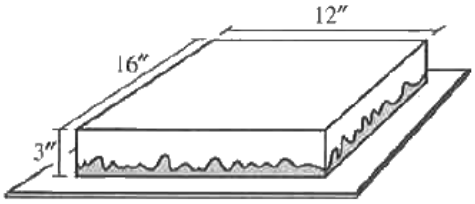
C. 88

D. 128

Answer: D

Watch Video Solution

14. At the Math Club meeting, Principal Gonzales cut the entire cake into pieces. Each piece is 2 inches wide, 2 inches long, and 3 inches high. What is the number of pieces Principal Gonzales cut the cake into?



A. 16

B. 20

C. 28

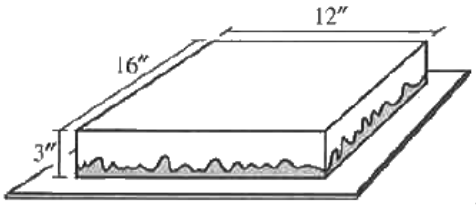
D. 48

Answer: D

 Watch Video Solution

15. The Math Club will pay Ken $5.00 for preparing the cake and will also pay him for the cost of the cake mix at $\$1.73$, the foresting mix at $2.67, and the sales tax of 5% on these 2 items. What is the total amount the Math Club

will pay Ken?



A. $4.67

B. $9.40

C. $9.45

D. $9.62

Answer: D

Watch Video Solution

16. What is the y-intercept of the line in the standard (x,y) coordinate plane that goes through the points (-3,6) and (3,2) ?

A. 0

B. 2

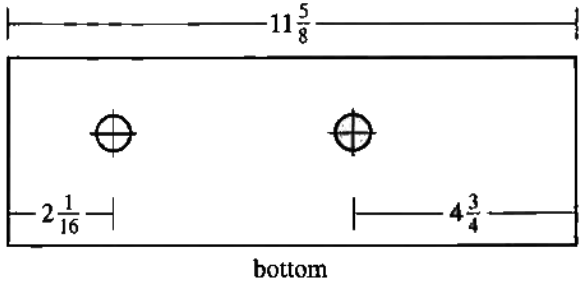
C. 4

D. 6

Answer: C

Watch Video Solution

17. A machine part is diagrammed in the figure below with the dimensions given in inches. If the centers of the circles lie on the same line parallel to the bottom of the part, what is the distance, in inches, between the centers of the 2 holes in the machine part?



A. $5\frac{3}{16}$

B. $5\frac{1}{16}$

C. 5

D. $4\frac{13}{16}$

Answer: D

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18. The depth of a pond is 180 cm and is being reduced by 1 cm per week. The depth of a second pond is 160 cm and is being reduced by $\frac{1}{2}$ cm per week. If the depths of both ponds continue to be reduced at these constant

rates, in about how many weeks will the ponds have the same depth?

A. 10

B. 20

C. 40

D. 80

Answer: C

Watch Video Solution

19. When graphed in the standard (x, y) coordinate plane, which of the following equations does NOT represent a line?

A. $x = 4$

B. $3y = 6$

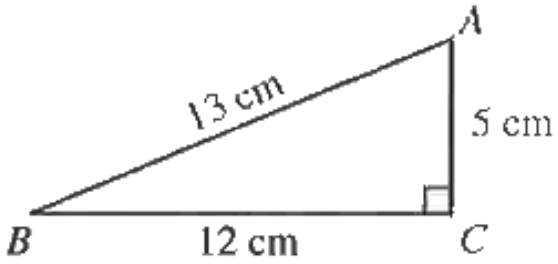
C. $x - y = 1$

D. $x^2 + y = 5$

Answer: D

Watch Video Solution

20. In the right triangle shown below, which of the following statements is true about $\angle A$?



A. $\cos A = \dfrac{12}{13}$

B. $\sin A = \dfrac{12}{13}$

C. $\tan A = \dfrac{12}{13}$

D. $\cos A = \dfrac{13}{12}$

Answer: B

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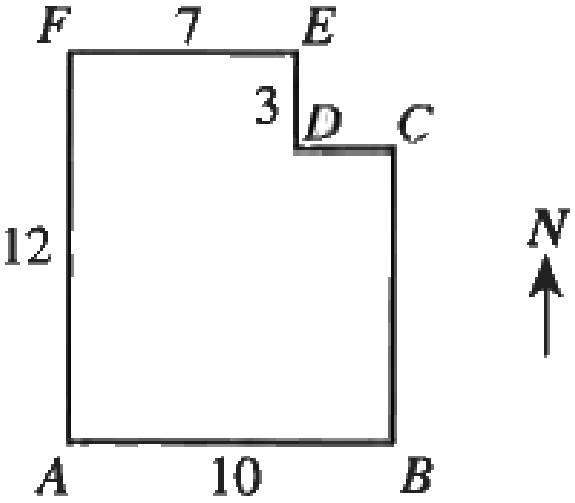
21. A park has the shape and dimensions in blocks given below. A water fountain is located halfway between point B and point D. Which of the following is the location of the water fountain from point A?

(Note: The park's borders run east-west or

north-south.)



A. $3\frac{1}{2}$ blocks east and 6 blocks north

B. 5 blocks east and $4\frac{1}{2}$ blocks north

C. 5 blocks east and 6 blocks north

D. $8\frac{1}{2}$ block east and $4\frac{1}{2}$ block north

Answer: D

View Text Solution

22. The braking distance, y feet, for Damon's car to come to a complete stop is modeled by $y = \frac{3(x^2 + 10x)}{40}$, where x is the speed of the car in miles per hour. According to this model, which of the following is the maximum speed, in miles per hour, Damon can be driving so that the braking distance is less than or equal to 150 feet?

A. 10

B. 30

C. 40

D. 50

Answer: C

Watch Video Solution

23. If $f(x) = x^2 + x + 5$ and $g(x) = \sqrt{x}$, then what is the value of $\frac{g(4)}{f(1)}$?

A. $\frac{2}{7}$

B. $\frac{25}{7}$

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

D. 2

Answer: A

Watch Video Solution

24. At a school picnic, 1 junior and 1 senior will be selected to lead the activities. If there are 125 juniors and 100 seniors at the picnic, how

many different 2 person combinations of 1 junior and 1 senior are possible?

A. 25

B. 100

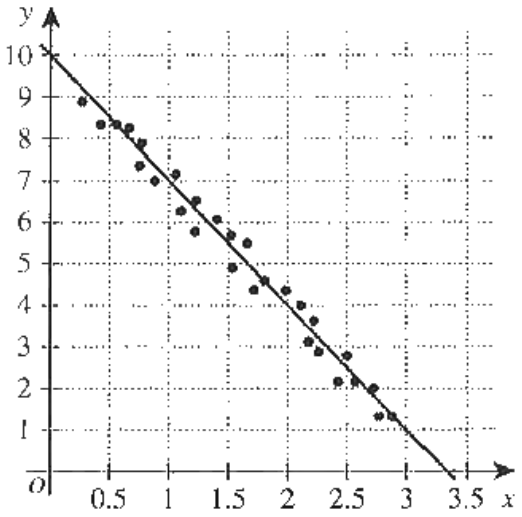
C. 125

D. 12500

Answer: D

 Watch Video Solution

25. The scatterplot in the standard (x,y) coordinate plane below contains data points showning a strong linear correlation between the variables x and y. Mia drew the line shown to model the data. One of the following equations represents Mia's line. Which one?



A. $y = -3x + 8$

B. $y = -3x + 10$

C. $y = -2x + 10$

D. $y = 2x + 10$

Answer: B

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26. The temperature, t, in degrees Fahrenheit, in a certain town on a certain spring day satisfies the inequality $|t - 24| \leq 30$. Which of

the followig temperatures , in degrees Fahrenheit, is NOT in this range?

A. -10

B. -6

C. -5

D. 0

Answer: A

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27. If 5 times a number n is subtracted from 15, the result is negative, Which of the following gives the possible value(s) for n?

A. 0 only

B. 3 only

C. 10 only

D. All n gt 3

Answer: D

 Watch Video Solution

28. For all $x > 21$, $\dfrac{(x^2+8x+7)(x-3)}{(x^2+4x-21)(x+1)} = ?$

A. 1

B. $\dfrac{9}{7}$

C. $\dfrac{x-3}{x+3}$

D. $\dfrac{2(x-3)}{x+1}$

Answer: A

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29. The median of a set of data containing 9 items was found. Four data items were added to the set. Two fo these items were greater that the original median, and the other 2 items were less than the original median. Which of the following statements must be true about the median of the new data set?

A. It is the average of the 2 new lower values

B. It is the same as the original median .

C. It is the average of the 2 new higher values.

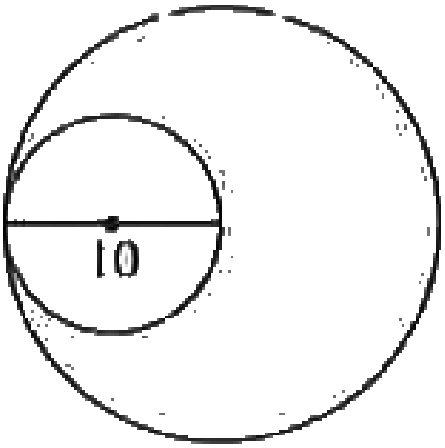
D. It is greater than the original median.

Answer: B

Watch Video Solution

30. The figure below shows 2 tangent circles such that the 10-centimeter diameter of the smaller circle is equal to the radius of the larger circle. What is the area, in square

centimeters, of the shaded region?



A. 10

B. 75

C. 5π

D. 75π

Answer: D

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31. The sign of a is positive. The sign of b is negative. If it can be determined, what is the sign of the mean of a and b?

A. Positive

B. Negative

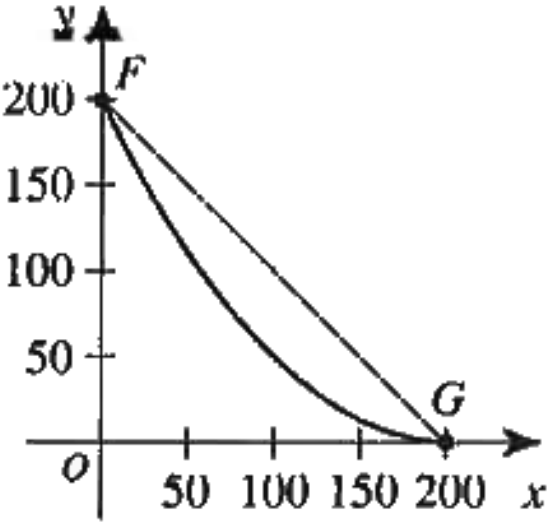
C. Both positive and negative

D. Cannot be determined from the given information.

Answer: D

Watch Video Solution

32. The curve $y = 0.005x^2 - 2x + 200$ for $0 \leq x \leq 200$ and the line segment from $F(0, 200)$ to $G(200, 0)$ are shown in the standard (x,y) coordinate plane below.



What is the y-coordinate for the point on the curve with x-coordinate 20?

A. 160

B. 162

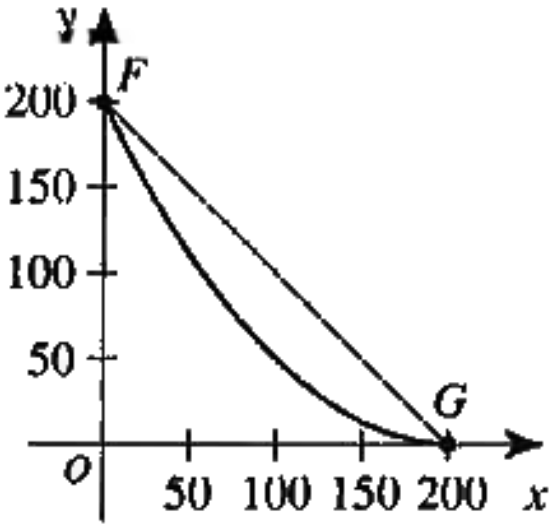
C. 164

D. 166

Answer: B

Watch Video Solution

33. The curve $y = 0.005x^2 - 2x + 200$ for $0 \leq x \leq 200$ and the line segment from $F(0.200)$ to $G(200, 0)$ are shown in the standard (x,y) coordinate plane below.



The length of this curve is longer that $\overline{FG}$.

About how many coordinate units long is $\overline{FG}$?

A. 20

B. 141

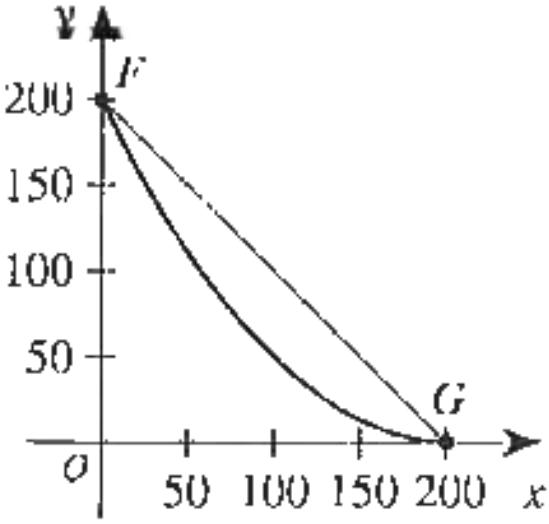
C. 200

D. 283

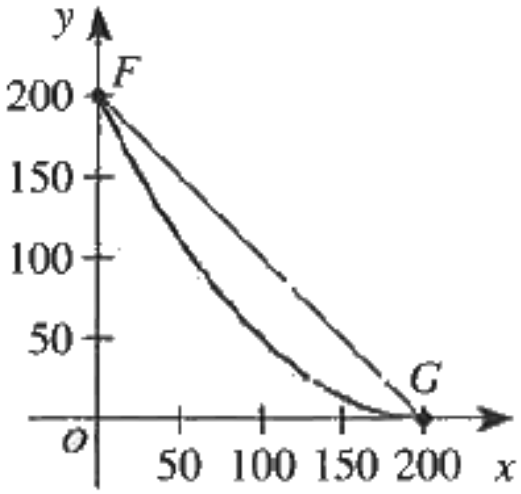
Answer: D

Watch Video Solution

34. The curve $y = 0.005x^2 - 2x + 200$ for $0 \leq x \leq 200$ and the line segment from $F(0.200)$ to $G(200, 0)$ are shown in the standard (x,y) coordinate plane below.



Tran wants to approximate the area underneath the curve $y = 0.005x^2 - 2x + 200$ for $0 \leq x \leq 200$, shown shaded in the graph below.



He finds an initial estimate, A, for the shaded area by using $\overline{FG}$ and computing $A = \frac{1}{2}(200units)(200units) = 20,000$ square units.

The area of the shaded region is:

A. less than 20,000 square units, because the curve lies under $\overline{FG}$.

B. less than 20,000 square units, because the curve lies over $\overline{FG}$.

C. equal to 20,000 square units.

D. greater than 20,000 square units, because the curve lies under $\overline{FG}$.

Answer: A

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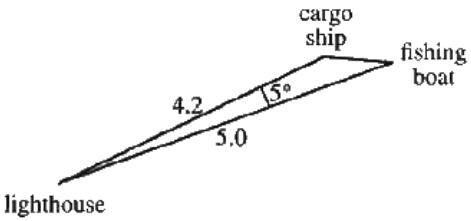
35. A cargo ship is 4.2 miles from a lighthouse, and a fishing boat is 5.0 miles from the lighthouse, as shown below. The angle between the straight lines from the lighthouse to the 3 vessels is 5°. The approximate distance in miles, from the cargo ship to the fishing boat is given by which of the following expressions?

(Note: The law of cosines states that for any triangle with vertices A, B and C adn the sides opposite those vertices with length a, b, and c,

respectively. $c^2 = a^2 + b^2 - 2ab\cos C$).



A. $\sqrt{(5.0)^2 - (4.2)^2}$

B. $\sqrt{(4.2)^2 + (5.0)^2 - 2 \cdot 4.2 \cdot 5.0\cos 5^\circ}$

C. $\sqrt{(4.2)^2 + (5.0)^2 + 2 \cdot 4.2 \cdot 5.0\cos 5^\circ}$

D. $\sqrt{(4.2)^2 + (5.0)^2 - 2 \cdot 4.2 \cdot 5.0\cos 85^\circ}$

Answer: B

Watch Video Solution

36. Which of the following equations expresses c in terms of a for all real numbers a, b and c such that $a^3 = b$ and $b^2 = c$?

A. $c = a^6$

B. $c = a^5$

C. $c = 2a^3$

D. $c = \frac{1}{2}a$

Answer: A

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37. After visiting Florida State University during spring break, Francisco rents a car for 2 days to travel around Florida. He has $255 to spend on car rental for the 2 days. Sea horse Car Rental charges $50 per day and $0.25 per mile. Ocean Blue Car Rental charges $60 per day and $0.20 per mile. Which company, if either, allows him to travel more miles for the 2 days, and how many miles more?

(Note: Taxes are already included in the rental charges)

A. Sea-Horse, 20

B. Ocean Blue, 55

C. Ocean Blue, 100

D. Sea Horse, 135`

Answer: B

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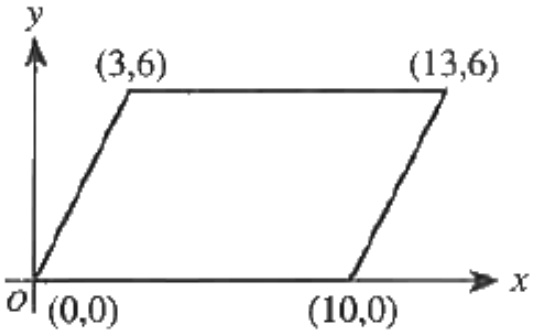
38. In the standard (x,y) coordinate plane below, the points (0,0), (10,0), (13,6) and (3,6) are the vertices of a parallelogram. What is the

area, in square coordinate units, of the parallelogram?



A. 30

B. 60

C. $30\sqrt{3}$

D. $30\sqrt{5}$

Answer: B

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39. For every pair of natural number n and m, to which of the following sets must n + m belong?

I. The natural numbers

II. The intergers

III. The rational numbers

IV. The real numbers

V. The complex numbers

A. I,II and III only

B. II, III and IV only

C. III, IV and V only

D. I,II,III,IV and V

Answer: D

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40. A certain pefect square has exactly 4 digits (that is, it is an integer between 1,000 and 9,999). The positive square root of the perfect square must have how many digits?

A. 1

B. 2

C. 3

D. 4

Answer: B

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41. A certain hotel has 80 rooms. Based on many prvious years' occupancy rates, the owners of the hotel constructed the table

below showing the daily occupancy rates and their probabilities of occurring for the coming summer season. Based on the probability distribution in the table, to the nearest whole number, what is the expected number of rooms that will be occupied on any day during the coming summer season?

Occupancy rate	Probability
0.60	0.20
0.70	0.40
0.80	0.30
0.90	0.10

A. 20

B. 25

C. 58

D. 60

Answer: C

Watch Video Solution

42. What is the matrix product $\begin{bmatrix} a \\ 2a \\ 3a \end{bmatrix} \begin{bmatrix} 1 & 0 & -1 \end{bmatrix}$?

A. $\begin{bmatrix} a & 0 & -a \\ 2a & 0 & -2a \\ 3a & 0 & -3a \end{bmatrix}$

B. $\begin{bmatrix} a & 2a & 3a \\ 0 & 0 & 0 \\ -a & -2a & -3a \end{bmatrix}$

C. $\begin{bmatrix} 2a & 0 & -2a \end{bmatrix}$

D. $\begin{bmatrix} 6a & 0 & -6a \end{bmatrix}$

Answer: A

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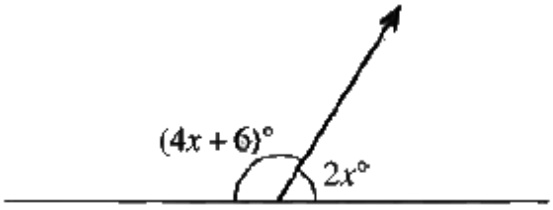
43. What is the degree measure of the smaller of the 2 angles formed by the line and the ray

shown in the figure below?



A. 14°

B. 28°

C. 29°

D. 58°

Answer: D

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44. Let a equal $2b + 3c - 5$.What happens to the value of a if the value of b decreases by 1 and the value of c increases by 2?

A. It increases by 4

B. It is increases by 2

C. It increases by 1

D. It is unchanged

Answer: A

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45. Shima will mix 1 fluid ounce of fertilizer in water for every 40 square feet of soil. At this rate, which of the following expressions gives the number of gallons of fertilizer that Shima will mix in water for 0.5 acres of soil?

(Note : 1 acre = 43,560 square feet, 1 gallon = 128 fluid ounces)

A. $\dfrac{0.5(40)(128)}{43,560}$

B. $\dfrac{40(128)}{0.5(43,560)}$

C. $\dfrac{0.5(43,560)}{40(128)}$

D. $\frac{43,560}{0.5(40)(128)}$

Answer: C

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46. A restaurant has 10 booths that will seat up to 4 people each. It 20 people are seated in booths, and NO booths are empty, what is the greatest possible number of boths that could be filled with 4 people?

A. 0

B. 1

C. 2

D. 3

Answer: D

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47. Let A and B be independent events. Denote P(A) as the probability that Event A will occur, and denote $P(A \cap B)$ as the probability that

Events A and B will both occur. Which of the following equations must be true?

A. $P(A) = P(B)$

B. $P(A) = 1 - P(B)$

C. $P(A \cap B) = P(A) + P(B)$

D. $P(A \cap B) = P(A) \cdot P(B)$

Answer: D

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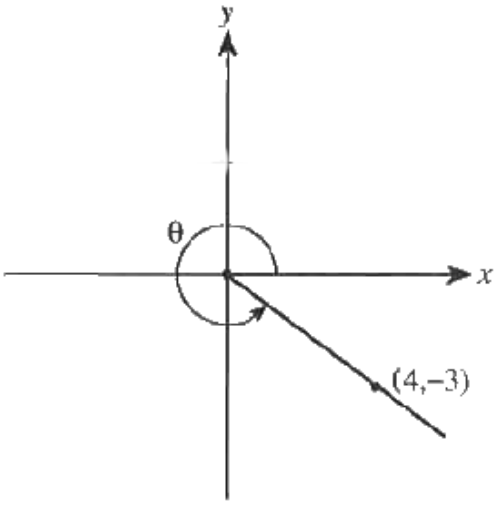
48. In the standard (x,y) coordinate plane below, an angle is shown whose vertex is the origin. One side of this angle with measure θ passes through (4, -3), and the other side include the positive x-axis. What is the cosine of θ?



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

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

C. $-\frac{3}{5}$

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

Answer: D

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49. Which of the following expressions, if any, are equal all real number x?

I $\sqrt{(-x)^2}$

II $\left| -x \right|$

III $-\left| x \right|$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

Answer: A

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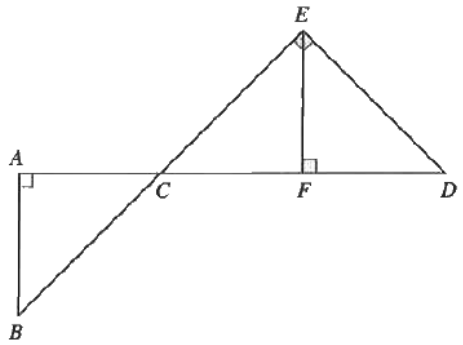
50. In the figure below, A, C, F and D are collinear, B, C and E are collinear, and the angles at A, E, and F are right angles, as marked. Which of the following statements is NOT justifiable from the given information?



A. $\overleftrightarrow{AB}$ is parallel to $\overleftrightarrow{EF}$

B. $\overline{DE}$ is perpendicular to $\overline{BE}$

C. $\angle ACB$ is congruent to $\angle FCE$

D. $\overline{CE}$ is congruent to $\overline{ED}$

Answer: D

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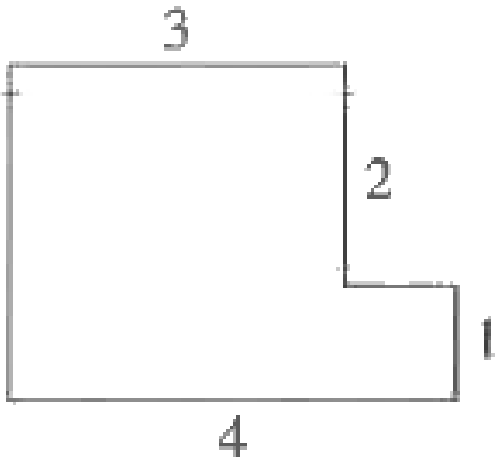
51. In the figure below, all line segments are either horizontal or vertical and the dimensions given are in inches. What is the

perimeter, in inches, of the figure?



A. 10

B. 12

C. 13

D. 14

Answer: D

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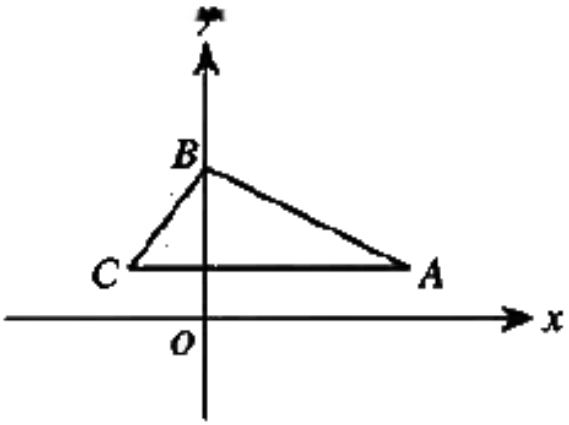
52. Triangle $\triangle ABC$ has vertices A(8,2), B(0,6), and C(-3,2). Point C can be moved along a certain line, with points A and B remaining stationary, and the area of $\triangle ABC$ will not

change. What is the slope of that line?



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

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

C. 0

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

Answer: A

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53. On his first day as a telemarketer, Marshall made 24 calls. His goal was to make 5 more calls on each successive day than he had made the day before. If Marshall met, but did not exceed, his goal, how many calls had he made in all after spending exactly 20 days making calls as a telemarketer?

A. 670

B. 690

C. 974

D. 1430

Answer: D

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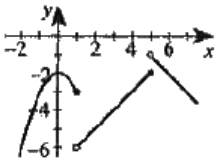
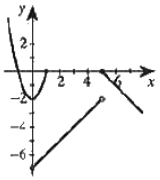
54. Which of the following is the graph of the fuctions f(x) defined below?

$$f(x) = \begin{array}{ll} x^2 - 2 & \text{for} \quad x \leq 1 \\ x - 7 & \text{for} \quad 1 < x < 5 \\ 4 - 7 & \text{for} \quad x \geq 5 \end{array}$$

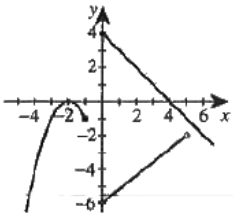
A.



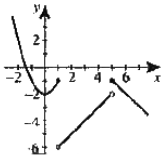
B.



C.



D.



Answer: D

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55. Which of the following expressions given the number of permulations of 15 objects taken 5 at a time?

A. 15(5)

B. (15 - 5)!

C. $\frac{15!}{5!}$

D. $\frac{15!}{(15-5)!}$

Answer: D

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56. For all $x > 0$, which of the following expressions is equivalent to $\frac{i}{\sqrt{x} - i}$, where $i = \sqrt{-1}$?

A. i

B. $\frac{\sqrt{x}}{x}$

C. $\frac{\sqrt{x} - 1}{x + 1}$

D. $\frac{i\sqrt{x} - 1}{x + 1}$

Answer: D

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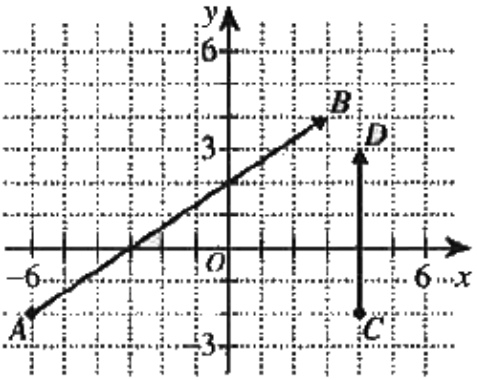
57. Vectors $\overrightarrow{AB}$ and $\overrightarrow{CD}$ are shown in the standard (x,y) coordinate plane below. One of the following is the unit vector notation of the vector $\overrightarrow{AB} + \overrightarrow{CD}$. Which one?



A. $-6i + 3j$

B. $3i + 1j$

C. $3i + 9j$

D. $9i + 11j$

Answer: D

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58. A simple pendulaum consists of a small mass suspended from a string that is fixed at its upper end and has negligible mass. The length of time, t second, for complete swing of a simple pendulum can be modeled by the

equation $t = 2\pi\sqrt{\frac{L}{32}}$, where L is the length, in feet, of the string. If the time required for a complete swing of Pendulum 1 is triple the time required for a complete swing of Pendulum 2, the length of Pendulum 1's string is how many times the length of Pendulum 2's string?

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

B. 3

C. 6

D. 9

Answer: D

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59. If $\log_e x = s$ and $\log_e, y = t,$ then $\log_e (xy)^2 = ?$

A. $2(s + t)$

B. $s + t$

C. $4st$

D. $2st$

Answer: A

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60. Jennifer's best long jump distance increased by 10% from 1990 to 1991 and by 20% from 1991 to 1992. By what percent did her best long jumb distance increase from 1990 to 1992?

A. 0.32

B. 0.3

C. 0.2

D. 0.15

Answer: A

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