MATHS

BOOKS - PRINCETON MATHS (ENGLISH)

PRACTICE SECTION 3

Mcqs

1. For each of 3 years , the table below gives the number of different routes a runner ran ,

the number of runs she ran , and the total number of miles she ran .

Year	Routes	Runs	Total miles run
2005	12	395	1,255
2006	12	396	1,014
2007	11	368	1,898

To the nearest tenth of a mile , what is the average number of miles the runner ran per run in 2005 ?

A. 2.5

B. 2.6

C. 3.2

D. 4.8

Answer: C

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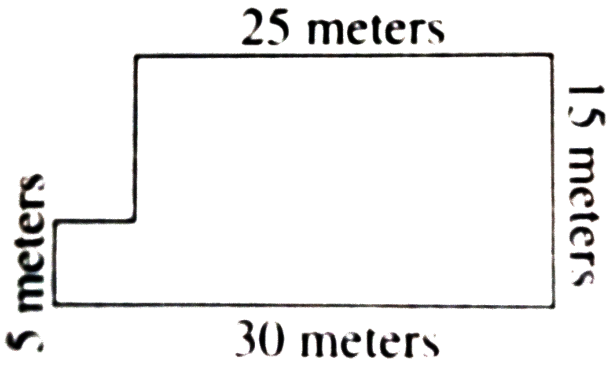
2. The lengths of 2 sides are not given in the polygon below. If each angle between adjacent sides measures 90°, then , in meters, what is

the perimeter of the polygon ?



A. 75

B. 90

C. 95

D. 400

Answer: B

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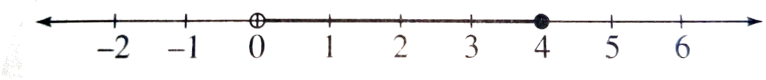
3. Which of the following inequalities represents the graph shown below on the real number line ?



A. $0 < x < 5$

B. $0 < x \leq 4$

C. $-2 < x \leq 4$

D. $1 \leq x \leq 4$

Answer: B

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4. What is the value of $4 + 3^{x-y}$ when x=3 and y=-1 ?

A. 13

B. 16

C. 30

D. 85

Answer: D

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5. For integers x and y such that xy=14, which of the following is NOT a possible value of x ?

A. 2

B. 1

C. -7

D. -8

Answer: D

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6. In cubic meters , what is the volume of a large cube whose edges each measure 6 meters in length ?

A. 18

B. 36

C. 64

D. 216

Answer: D

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7. Pat's Pastries baked 80 apple pies and 50 loaves of apple bread to be sold at a 2-day Fall Festival. The pies were sold for $25 each and the loaves of bread were sold for $10 each . Which of the following expressions gives the total amount of money, in dollars, collected from selling all of the apple pies and B of the loaves of bread ?

A. 35B

B. 1,570B

C. B+80

D. 10B+2,000

Answer: D

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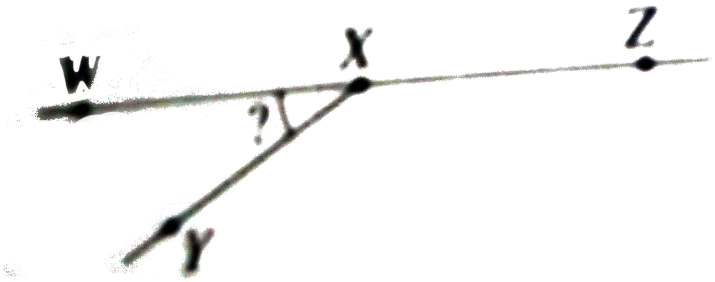
8. In the figure below, W,X , and Z are collinear , the measure of $\angle WXY$ is $4a^\circ$, and the measure of $\angle YXZ$ is $11a^\circ$. What is the

measure of $\angle WXY$?



A. 12°

B. 48°

C. 96°

D. 132°

Answer: B

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9. Each of the following values could represent a probability EXCEPT :

A. 0.00004

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

C. 0.7

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

Answer: D

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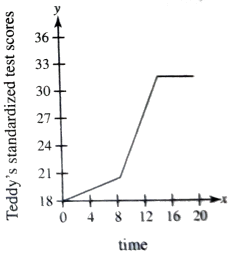
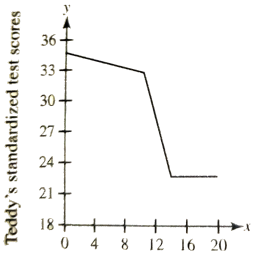
10. For the first several weeks after hiring a private tutor, Teddy's score on a standardized test increased slowly . As Teddy began to understand the concepts more clearly , though , his standardized test scores improved more rapidly. After several more weeks, Teddy stopped working with his tutor and his scores did not imporve any more . Which of the following graphs could represent all of Teddy's standardized test scores as a function of times , in weeks, after he hired a private tutor ?

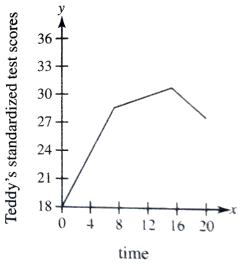
A.


Teddy's standardized test scores
y
36
33
30
27
24
21
18
0 4 8 12 16 20
x
time

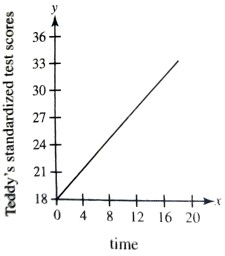
B.


Teddy's standardized test scores
y
36
33
30
27
24
21
18
0 4 8 12 16 20
x
time

C.


Teddy's standardized test scores
y
36
33
30
27
24
21
18
0 4 8 12 16 20
x
time

D.


Teddy's standardized test scores
y
36
33
30
27
24
21
18
0 4 8 12 16 20
x
time

Answer: A

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11. The Northampton Volunteer Association has built a rectangular sandbox for a local elementary school and is ready to fill it with sand. The sandbox is 60 inches wide, 72 inches long, and will be filled 18 inches deep. Under the assumption that 1 bag of sand can fill 3,600 cubic inches of the sandbox, what is the

minimum number of bags of sand they will need in order to fill the sandbox ?

A. 1

B. 7

C. 12

D. 22

Answer: D

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12. Salvador is trying to scale his rectangular self-portrait down to postcard size. The painting is 9 feet wide by 16 feet long. He is using a scale of $\frac{1}{3}$ inch = 1 foot for the postcard-sized self-portrait . What will be the dimensions, in inches , of Salvador's postcard - sized self - portrait ?

A. $1\frac{1}{3}$ by 4

B. 3 by $5\frac{1}{3}$

C. 3 by 4

D. 27 by 48

Answer: B

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13. The Crestview High School student body is made up only of freshmen , sophomores , juniors, and seniors . 25% of the students are freshmen , 35% are sophomores , and 20% are juniors . If no student can be considered to be in two classes, and there are 150 seniors , how

many students make up the Crestview High School student body ?

A. 230

B. 500

C. 600

D. 750

Answer: D

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14. The circumference of a car tire is 75 inches . About how many revolutions does this car tire make traveling 225 feet (2,700 inches) without slipping ?

A. 3

B. 14

C. 36

D. 225

Answer: C

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15. $(2-4t+5t^2)-(3t^2+2t-7)$ is equivalent to :

A. $2t^2-6t+9$

B. $2t^2-2t+9$

C. $2t^4-2t^2-5$

D. $8t^2-6t-5$

Answer: A

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16. At Blackstone Café , a regular entrée costs $18.00, while an entrée off the children's menu costs less. Cliff treats his niece to dinner at the café and spends $\frac{1}{3}$ of a gift certificate on her children's entrée and a drink . Afterwards, she orders a $6.00 dessert and he pays for that as well. When Cliff has paid for all of his niece's food , he has exactly enough money left on the gift certificate to pay for his regular entree. How much money was the gift certificate worth ?

A. $34.00

B. $35.00

C. $36.00

D. $37.00

Answer: C

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17. In June , Mrs . Kunkel gave her English students 15 books to read over the summer . When classes resumed in September, she

asked them what percentage of the books they had finished . Only one of the following values represents a posible percentage of books a student could have completed . Which one is it ?

A. $65\ \%$

B. $68\ \%$

C. $70\ \%$

D. $80\ \%$

Answer: D

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18. A geometric sequence has as its first 4 terms , -0.125 , 1, -8 and 64. What is the 5th term of this sequence ?

A. 512

B. 73

C. -55

D. 512

Answer: D

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19. What of the following is equivalent to $(a-5b)^2$?

A. 2a-10b

B. a^2-25b^2

C. $a^2-10ab+25b^2$

D. $a^2-12ab+25b^2$

Answer: C

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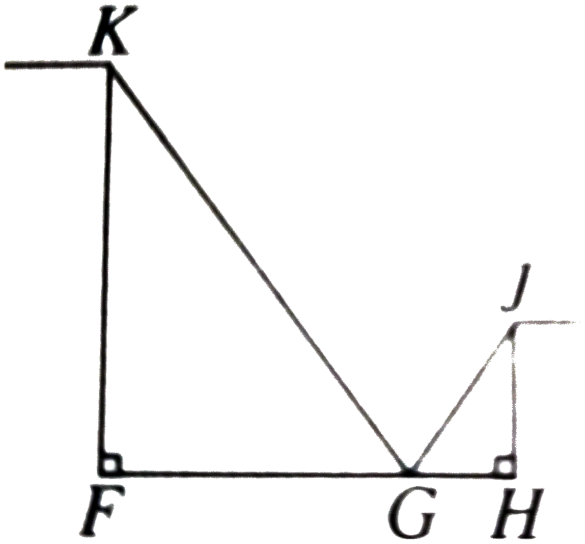
20. As shown in the figure below, Tony has determined that he must ride his skateboard down a long ramp to be able to jump a shorter ramp with enough time to complete a new trick. First, he needs to determine the dimensions of both the shorter and longer ramps. Tony is on his skateboard at point K, 20 feet above the ground . He then notes that the vertical height $\overline{HJ}$ of the shorter ramp is 6 feet above the ground, and the length of the shorter ramp $\overline{GJ}$ is 9 feet. Approximately how

many feet long is the longer ramp ?



A. 3

B. 12

C. 15

D. 30

Answer: D

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21. What is the solution to the equation 9x-(3x-1)=3 ?

A. -3

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

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

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

Answer: C

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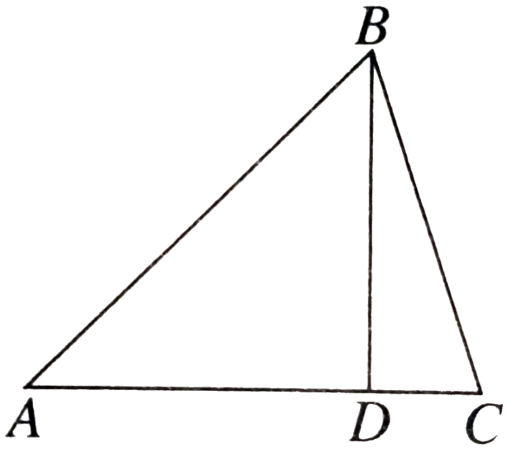
22. The area of $\triangle ABC$ below is 54 square meters. If altitude $\overline{BD}$ is 9 meters long , how long is $\overline{AC}$, in meters ?



A. 3

B. 6

C. 9

D. 12

Answer: D

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23. Given $g(x) = 4x^2 - 8x + 2$, what is the value of g(-5) ?

A. 442

B. 142

C. 67

D. -58

Answer: B

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24. A company will reimburse its employees' personal expenses on weekend business trips . It will reimburse \$0.80 for every \$1.00 an

employee spends , up to $100.00 . For the next $200 an employee spends , the company will reimburse $0.70 for every $1.00 spent. For each additional dollar spent, the company will reimburse $0.60 . If an employee was reimbursed $400.00 , approximately how many dollars must she have spent on a weekend business trip ?

A. 667

B. 600

C. 500

D. 400

Answer: B

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25. The following table shows the ages of all the attendees of Camp Wannaboggin.

Age	9	10	11	12	13
Percent of campers	10%	24%	21%	37%	8%

What percent of the Wannaboggin campers are at least 11 years old ?

A. $34\ \%$

B. $45\ \%$

C. $50\ \%$

D. $66\ \%$

Answer: D

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26. What percent of $\frac{5}{8}$ is $\frac{1}{8}$?

A. $13\ \%$

B. $20\ \%$

C. $55\ \%$

D. $63\ \%$

Answer: B

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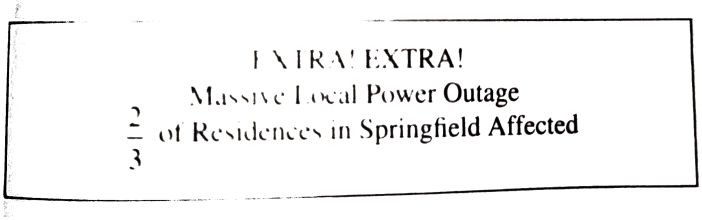
27. The newspaper headline below tells about a power outage. If there are 63,000 residences in Springfield , how many residences were

affected by the outage ?



A. $10,500$

B. $21,000$

C. $31,500$

D. $42,000$

Answer: D

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28. The ratio of a side of square X to the length of rectangle Z is 3:4 . The ratio of a side of square X to the width of rectangle Z is 3:2. What is the ratio of the area of square X to the area of rectangle Z ?

A. $1:1$

B. $2:1$

C. $3:2$

D. $9:8$

Answer: D

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29. In her Algebra II Class , Mrs. Pemdas writes the following statement on the board: " a varies inversely as the product of b^2 and c , and directly as d^3 . " She then asks her students to translate the statement into an equation . What of the following equations , with k as the constant of proportionality , is a correct translation of Mrs. Pemdas's statement ?

A. $a = \frac{kd^3}{b^2c}$

B. $a = \frac{kb^2c}{d^3}$

C. $a = \frac{b^2cd^3}{k}$

D. $a = \frac{b^2c}{kd^3}$

Answer: A

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30. In a certain isosceles triangle , the measure of the vertex angle is four times the measure

of each of the base angles , what is the measure , in degrees, of the vertex angle ?

A. 30°

B. 45°

C. 60°

D. 120°

Answer: D

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31. A restaurant decides on the following production model, where N is the number of ounces of flour the restaurant purchases each month, based on the number of ounces , x , the restaurant uses during the preceding month, $N = x^2 - 600x - 160,000$. According to this model , what is the greatest quantity of flour, in number of ounces, that the restaurant can use during a month , without having to purchase any new flour the next month ?

A. 800

B. 550

C. 400

D. 350

Answer: A

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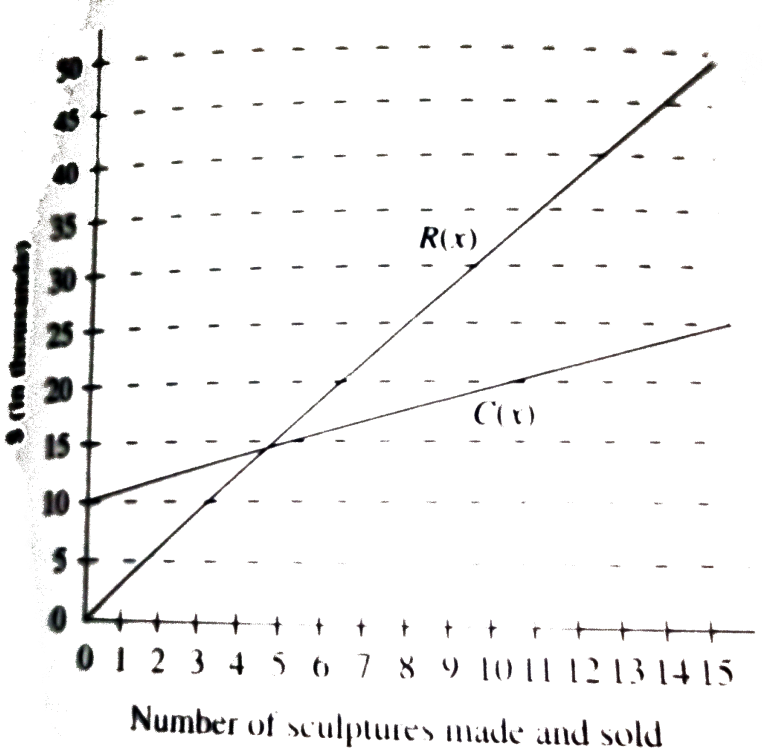
32. A poor , frustrated artist named Fresco created a plan to make money. He collected trash, repurposed it into sculptures, then

asked various celebrities to write and paint on these trash objects, which he then sold on his own as modern high art. The chart below separately shows the cost and revenue of his plan. The linear cost function, $C(x)$, represents the total money spent to make and market the art , while the linear revenue function, $R(x)$, shows the amount of money he has made in sculpture sales.



Fresco initially spent money promoting the project in the media . He also had to pay the celebrities to participate . After 6 months , Fresco had created and sold x number of trash sculptures and finally broke even : he hadn't made or lost any money . How many

sculptures did Fresco sell in his first 6 months of the project ?

A. 3

B. 5

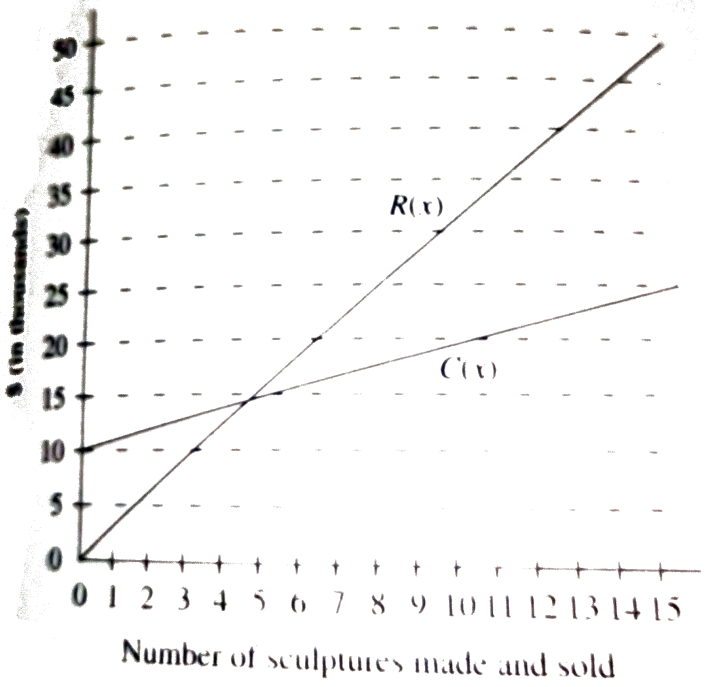
C. 7

D. 10

Answer: B

View Text Solution

33. A poor , frustrated artist named Fresco created a plan to make money. He collected trash, repurposed it into sculptures, then asked various celebrities to write and paint on these trash objects, which he then sold on his own as modern high art. The chart below separately shows the cost and revenue of his plan. The linear cost function, C(x) , represents the total money spent to make and market the art , while the linear revenue function, R(x) , shows the amount of money he has made in sculpture sales.



The cost function in the chart is determined by a constant production cost per sculpture - in this case, the amount Fresco pays each celebrity to participate - as well as a fixed cost , or the initial cost of promoting the project . What is the fixed cost of Fresco's trash sculpture project ?

A. $\$1,000$

B. $\$5,000$

C. $\$10,000$

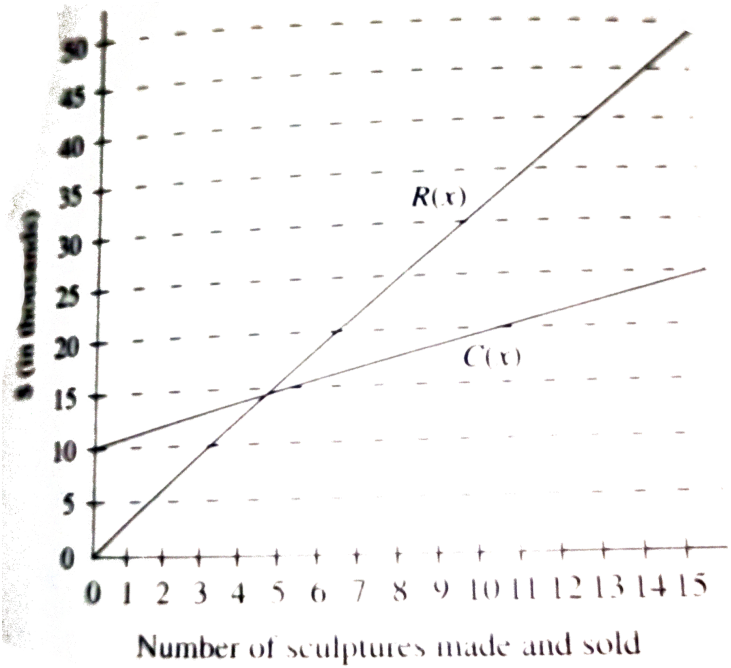
D. $\$15,000$

Answer: C

View Text Solution

34. A poor , frustrated artist named Fresco created a plan to make money. He collected trash, repurposed it into sculptures, then

asked various celebrities to write and paint on these trash objects, which he then sold on his own as modern high art. The chart below separately shows the cost and revenue of his plan. The linear cost function, $C(x)$, represents the total money spent to make and market the art , while the linear revenue function, $R(x)$, shows the amount of money he has made in sculpture sales.



The selling price of each trash sculpture is an integer number of dollars . According to the revenue function , what is the selling price of one trash sculpture ?

A. $\$1,000$

B. $\$1,667$

C. $\$2,000$

D. $\$3,000$

Answer: D

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35. Which of the following is a complete factorization of the expression $12b^2c + 6bc + 3b$?

A. 4bc+2c+1

B. $3b(9bc+2c+1)$

C. $3b(4bc+2c+1)$

D. $3b(4bc+2c)$

Answer: C

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36. Which of the following could be the equation of a line that passes through the points (-2,-7) and (2,17) in the standard (x,y) coordinate plane ?

A. $3x-2y=8$

B. $6x-y=-5$

C. $5x-2y=7$

D. $9x-2y=-16$

Answer: B

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37. A circle has a radius that is the same length as the sides of a square , if the square has a

perimeter of 64 square inches , what is the area , in square inches , of the circle ?

A. 16

B. 16π

C. 32π

D. 256π

Answer: D

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38. What is the y-coordinate of the solution of the following system, presuming the system has a solution ?

$8x + y = 30$

$8x + 4y = 96$

A. 1

B. 8

C. 19

D. 22

Answer: D

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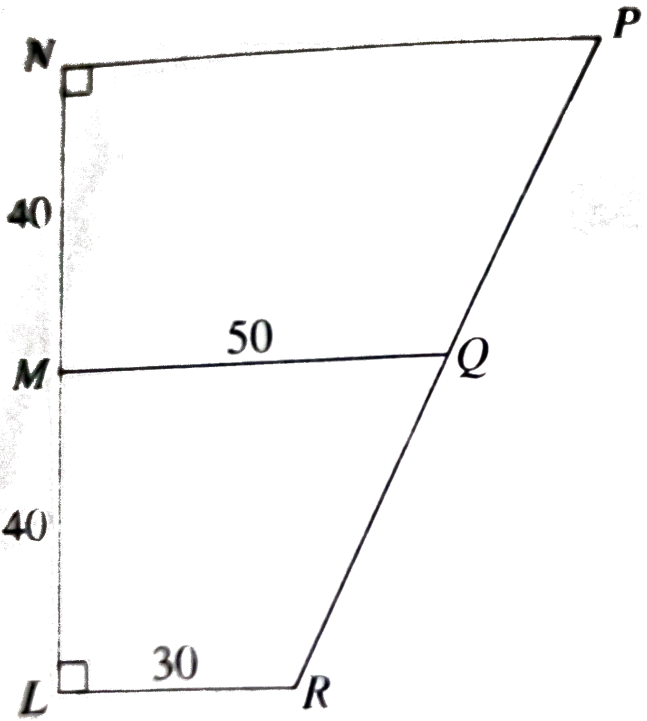
39. In the figure below , is on $\overline{NL}$ and Q is on $\overline{PR}$. The measurements are given in feet . Both NPQM and MQRL are trapezoids. The area , A , of a trapezoid is given by $A = \frac{1}{2}h(b_1 + b_2)$, where h is the height and b_1 and b_2 are the lengths of the 2 parallel sides.



What is the area of MQRL , in square feet ?

A. $3,200$

B. $1,750$

C. $1,600$

D. 600

Answer: C

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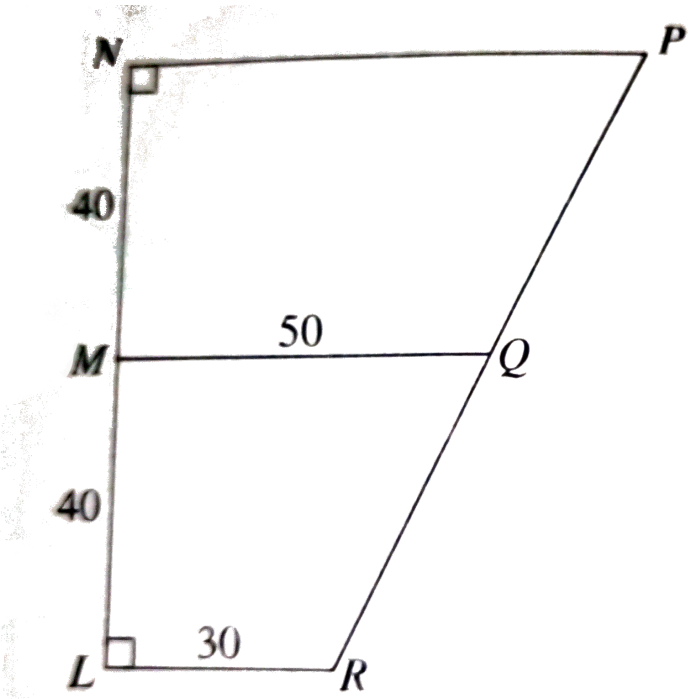
40. In the figure below , is on $\overline{NL}$ and Q is on $\overline{PR}$. The measurements are given in feet . Both NPQM and MQRL are trapezoids. The area , A , of a trapezoid is given by $A = \frac{1}{2}h(b_1 + b_2)$, where h is the height and b_1 and b_2 are the lengths of the 2 parallel

sides.



What is the length of $\overline{QR}$, in feet ?

A. $\sqrt{2,000}$

B. $\sqrt{1,640}$

C. $\sqrt{1,200}$

D. 50

Answer: A

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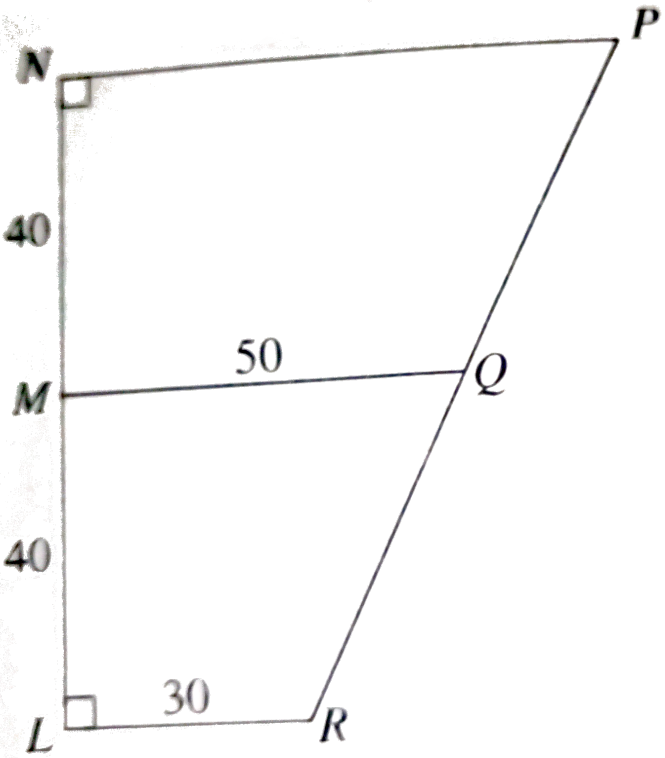
41. In the figure below , is on $\overline{NL}$ and Q is on $\overline{PR}$. The measurements are given in feet . Both NPQM and MQRL are trapezoids. The area , A , of a trapezoid is given by $A = \frac{1}{2}h(b_1 + b_2)$, where h is the height and b_1 and b_2 are the lengths of the 2 parallel

sides.



What is the diameter , in feet , of the largest circle that can be drawn inside MNPQ ?

A. 20

B. 40

C. 50

D. 60

Answer: B

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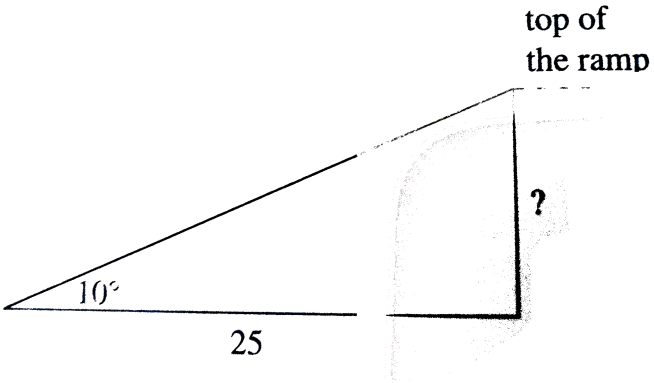
42. The figure below shows a ramp for skateboarders. The base of the ramp is 25 feet long, and it rises at a 10° angle.



Given the trigonometric calculations in the table below, how high off the ground will a skateboarder be at the top of the ramp , rounded to the nearest 0.1 foot ?

cos 10°	0.985
sin 10°	0.174
tan 10°	0.176

A. 2.3

B. 2.5

C. 4.3

D. 4.4

Answer: D

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43. The 12 numbers on a circular clock are equally spaced around the edges of the clock. Belinda chooses an integer, n that is greater

than 1.Beginning at a randomly chosen number, Belinda goes around the circle counterclockwise and paints in every nth number.She continues going around and around the clock , painting in every nth number , until all twelve numbers on the clock are painted. Which of the following could have been Belinda's integer n ?

A. 2

B. 3

C. 6

D. 7

Answer: D

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44. Consider the exponential equation $y = \frac{p^{(x+1)}}{K}$, where K and p are positive real constants and x is a positive real number. The value of y decreases as the value of x increases if and only if which of the following statements about p is true ?

A. 0 lt p lt 1

B. 1 lt p lt2

C. p gt -1

D. p gt 0

Answer: A

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45. What is the distance, in coordinate units , between the points M(1,-3) and N(-5,5) in the standard (x,y) coordinate plane ?

A. $\sqrt{14}$

B. $\sqrt{20}$

C. 8

D. 10

Answer: D

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46. During their daily training race, Carl has to stop to tie his shoes . Melissa, whose shoes are Velcro , continues to run and gets 20 feet

ahead of Carl . Melissa is running at a constant rate of 8 feet per second , and Carl starts running at a constant rate of 9.2 feet per second to catch up to Melissa . Which of the following equations , when solved for s, gives the number of seconds Carl will take to catch up to Melissa ?

A. 8s+20=9.2s

B. 8s-20=9.2s

C. $\frac{20 + 9.2s}{9.2} = 8s$

D. 8s=20

Answer: A

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47. Which of the following defines the solution set for the system of inequalities given below ?

$0 > 3x - 6$

$-4 < x$

A. x gt -4

B. x lt 2

C. $-4 < x < 18$

D. $-4 < x < 2$

Answer: D

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48. At the company YouGroove , 35 employees work in the sales department and 50 employees work in the operations department. Of these employees, 15 work in both the sales and the operations departments . How many

of the 110 employees at YouGroove do NOT work in either the sales or the operations departments ?

A. 10

B. 15

C. 20

D. 40

Answer: D

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49. The slope of a line in the standard (x,y) coordinate plane is 4. What is the slope of a line perpendicular to that line ?

A. 4

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

C. $-\frac{1}{4}$

D. -1

Answer: C

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50. The point (24,3) on a standard (x,y) coordinate plane is halfway between points (z,2x+1) and (15z,z-4) . What is the value of z ?

A. 1

B. 1.5

C. 3

D. 7

Answer: C

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51. How many 4-letter orderings , where no letters are repeated can be made using the letters of the word BADGERS ?

A. 4

B. 7

C. 256

D. 840

Answer: D

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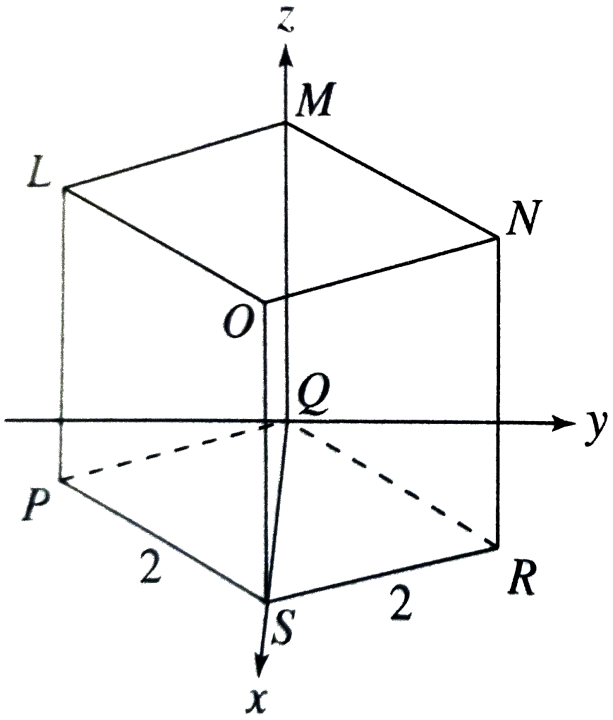
52. As shown in the (x,y,z) coordinate space below, the cube with vertices L through S has edges that are 2 coordinate units long. The coordinates of Q are (0,0,0) and S is on the positive x-axis . What are the coordinates of O

?



A. (2,0,2)

B. (2,2,2)

C. $\left(2\sqrt{2}, 0, 2\right)$

D. $\left(2\sqrt{2}, 0, 2\sqrt{3}\right)$

Answer: C

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53. Whenever a,b, and c are positive real numbers, which of the following expressions is equivalent to $\log_4 u - 2\log_8 b + \frac{1}{2}\log_4 c$?

A. $\log_4 a\sqrt{c} - \log_8 b^2$

B. $\frac{\log_4(ac)}{2} - \log_8 2b$

C. $\frac{\log_4\left(a\sqrt{c}\right)}{b}$

D. $\log_4(a-c) - \log_8 2b$

Answer: A

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54. If $-6 \leq a \leq -4$ and $3 \leq b \leq 7$, what is the maximum value of |a-2b| ?

A. 10

B. 11

C. 18

D. 42

Answer: D

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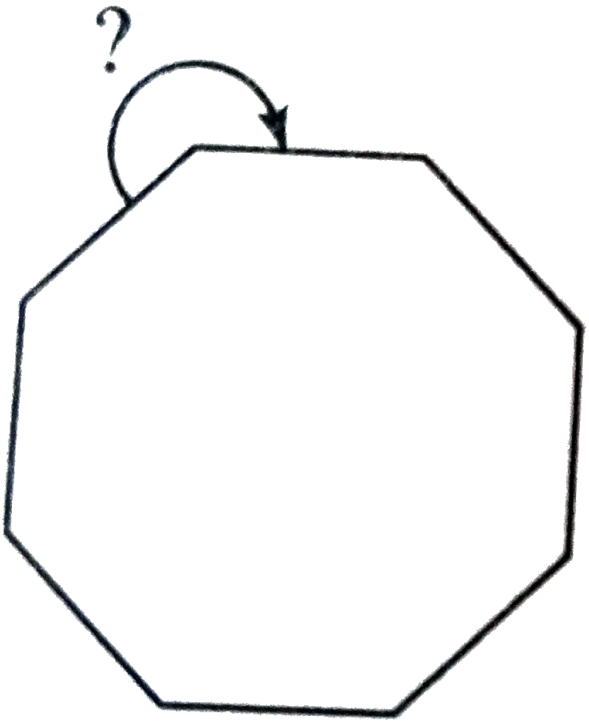
55. The measure of the sum of the interior angles of a regular n-sided polygon is (n-2) 180°. A regular octagon is shown below. What

is the measure of the designated angle ?



A. 135°

B. 144°

C. 200°

D. 225°

Answer: D

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56. Which of the following trigonometric functions has an amplitude of 3 ?

A. $f(x) = \frac{1}{3}\sin x$

B. $f(x) = \cos 3x$

C. $f(x) = \sin\left(\frac{1}{3}x\right)$

D. f(x)=3 cos x

Answer: D

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57. If A, x and y are all distinct numbers , and $A = \frac{xy - 2}{x - y}$ which of the following represents x , in terms of A and y ?

A. $\frac{Ay - 2}{A - y}$

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

C. $\frac{A-y}{x-y}$

D. $\frac{Ay-2}{A+y}$

Answer: A

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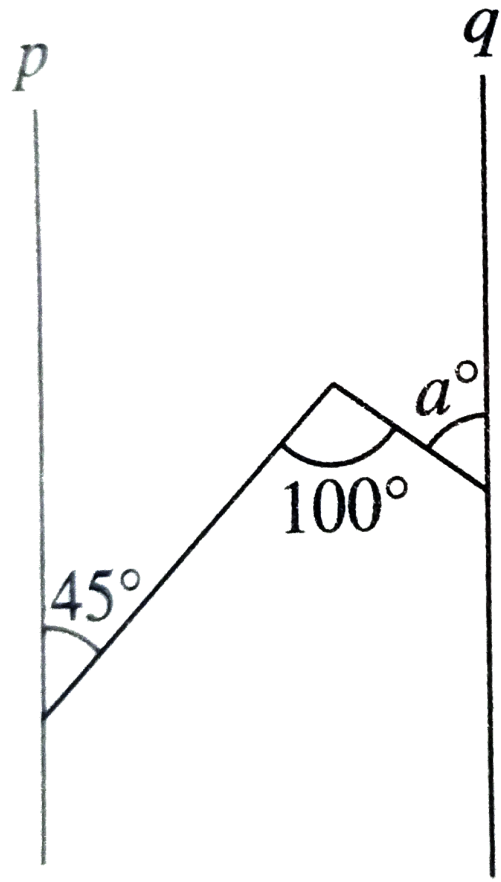
58. In the figure below , lines p and q are parallel and angle measures are as marked . If

it can be determined , what is the value of a ?



A. 35°

B. 45°

C. 55°

D. 100°

Answer: C

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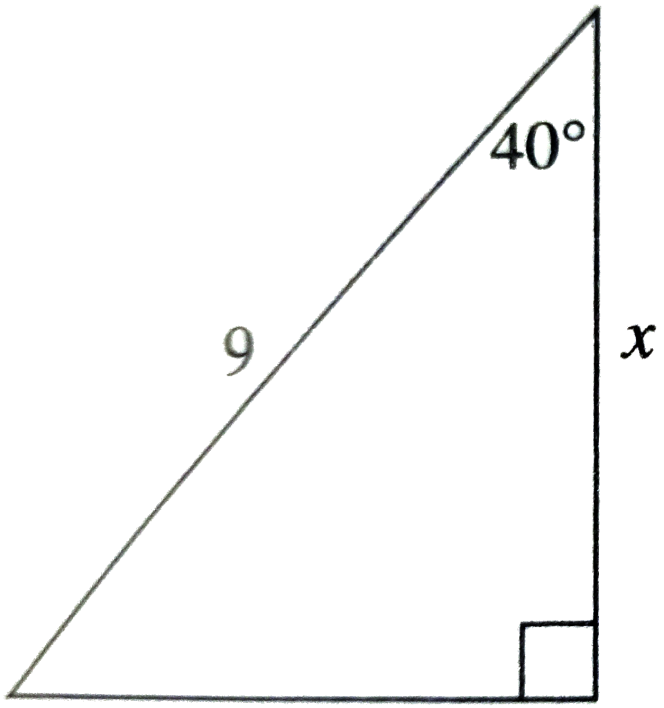
59. In the triangle below , the lengths of the two given sides are measured in centimeters.

What is the value , in centimeters, of x ?



A. $9\sin 40^\circ$

B. $9\sin 50^\circ$

C. $9\cos 50^\circ$

D. $9\tan 40^\circ$

Answer: B

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60. An angle in the standard (x,y) coordinate plane has its vertex at the origin and its initial side on the positive x-axis If the measure of an angle in standard position is $(1, 314^\circ)$, it has the same terminal side as an angle of each of the following measures EXCEPT:

A. 594°

B. 314°

C. 234°

D. -126°

Answer: B

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