MATHS

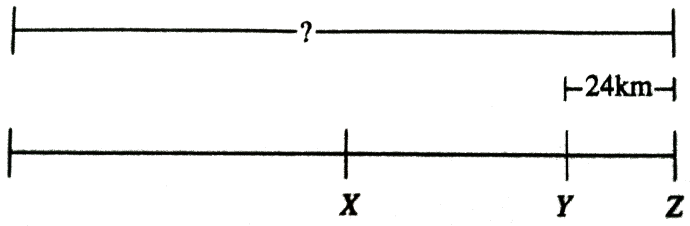
BOOKS - PRINCETON MATHS (ENGLISH)

MATH TEST 01

Mcqs

1. In the hiking trail shown below .X marks the trail's halfway point .If $\overline{YZ}$ measures 24

kilometers and is $\frac{1}{3}$ the length of $\overline{xz}$, what is the total length , in kilometers of the trail ?



A. 144

B. 104

C. 72

D. 48

Answer: A

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2. What is the value of x when $\frac{4x}{5} + 7 = 6$?

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

B. $-\frac{4}{5}$

C. -1

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

Answer: D

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3. Cyclist A averages 80 pedal revolutions per minute , and Cyclist B averages 61 pedal revolutions per minute .At these rates , how many more minutes does Cyclist B need than Cyclist A to make 9,760 pedal revolutions?

A. 19

B. 38

C. 122

D. 144

Answer: B

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4. The perimeter of square is 36 inches . What is the area of the square , in square inches ?

A. 6

B. 9

C. 18

D. 81

Answer: D

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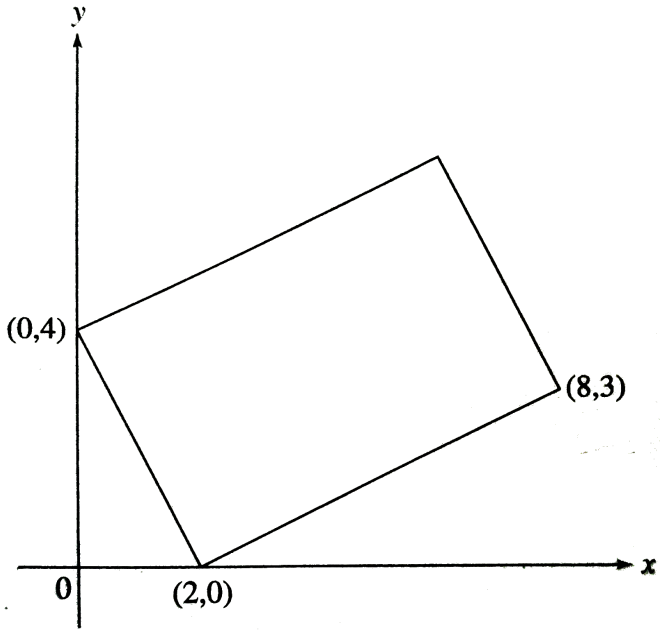
5. For the rectangle shown in the standard (x, y) Coordinate plane below , what are the coordinate of the unlabeled vertex ?



A. $(4, 5)$

B. $(4, 7)$

C. $\left(5, \frac{7}{2}\right)$

D. $(6, 7)$

Answer: D

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6. Carla has 5 times as many notebooks as her brother does . If they have 42 notebooks

between them , how many notebooks does carla have ?

A. 30

B. 33

C. 35

D. 37

Answer: D

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7. IF G is in the interior of right angle $\angle DEF$, then which of the following could be the measure of $\angle GEF$?

A. 85°

B. 95°

C. 105°

D. 115°

Answer: D

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8. Susie has three T- shirts : one red , one blue , and block she also has three pairs of shorts : one red , one blue , and one block ,How many different combination are there for susie to wear exactly one T- shirt and one pair of shorts ?

A. 3

B. 6

C. 8

D. 9

Answer: D

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9. 20% of 20 is equal to 50% of what number ?

A. 2

B. 4

C. 8

D. 10

Answer: A

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10. There are 45 Musicians in an orchestra , and all play two instruments . Of these musicians , 36 play the piano , and 22 play the violin . What is the maximum possible number of orchestra members who play both the piano and the violin ?

A. 9

B. 13

C. 22

D. 23

Answer: B

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11. What is the largest value of m for which there exists a real value of n such that $m^2 = 196 - n^2$?

A. 14

B. 95

C. 182

D. 196

Answer: A

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12. Phil earned \$800 at his summer job and saved all of his earnings .He wants to buy a deluxe drum kit that is regularly priced at \$925 but is on sale for $\frac{1}{5}$ off . The drum kit is subject to 5% sales tax after all discounts are

applied . If phil buys the kit on sale and gives the sales cherk his entire summer earnings , how much change should he receive ?

A. 23

B. 37

C. 40

D. 77

Answer: B

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13. which of the following numbers is an imaginary number ?

A. $\sqrt{64}$

B. $\sqrt{11}$

C. $-\frac{4}{sqrr(3)}$

D. $-\sqrt{-64}$

Answer: C

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14. Which of the following correctly factors the expression $25x^4 - 16y^8$?

A. $(25 - 16)(x^2 - y^4)(x^4 + y^4)$

B. $(5x^2 - 4y^4)(5x^2 + 4y^4)$

C. $(25x^2 - y^4)(x^2 + 16y^4)$

D. $(5x^4 - 4y^8)(5x^4 + 4y^8)$

Answer: C

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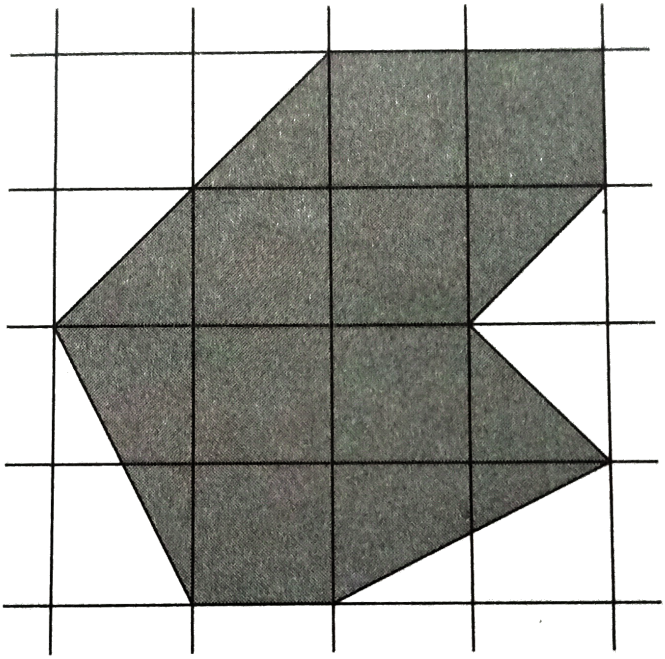
15. The figure shows a portion of a tile floor from which the shaded polygon will be cut in order to make a repair a Each square tile has sides that measure I foot ,Every vertex of the shaded polygon is at the intersection of 2 tiles . what is the area , in square feet of the shaded

poluygon ?



A. 9.5

B. 10.0

C. 10.5

D. 11.0

Answer: B

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16. The percent p of a popuation that has completed 4 years of college is given by the function $p(t) = -0.001t^2 + 0.4t$. Where t represents time , in years . What percent of the population has completed four years of college after 20 years , to the nearest tenth ?

A. 0.1

B. 7.6

C. 8.0

D. 8.4

Answer: B

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17. At Fatima 's Fruits , a bag of eight graperfruits costs $\$4.40$. At Ernie 's edibles , a ,bag of three grapefruits costs $ 1.86 . How

much cheaper , per grapefruit, is the cost at Fatima 's Fruits than At Ernie 's Edibles ?

A. `$0.07

B. $0.35

C. $0.59

D. $1.17

Answer: D

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18. Which of the following is equivlent to $(x^4 - 4)(X^4 + 4)$?

A. $2x^2$

B. $x^8 - 16$

C. $x^8 + 16$

D. $x^{16} - 16$

Answer: B

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19. Wade is making a tile mosaic . He begins the project by laying tile at a speed of 50 pieces per hour for 3.5 hours . He is then interrupted from his work for 60 minutes . He resume working and lays tile at a speed of 35 pieces per hours until he has laid 280 pieces of tile total. How many hours did Wade spend working on the mosaic after he started working again ?

A. 2.5

B. 3

C. 3.5

D. 4

Answer: B

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20. Point C (1,2) and point D (7,10) lie in the standard coordiant plane . What are the coordinates of the midpoints of $\overline{CD}$

A. (1,8)

B. $(3, -6)$

C. $(4, -4)$

D. $(4, -6)$

Answer: C

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21. Micheael is planning to put fencing along the edge of his rectangular backyard , which is 22 yards by 16 yards . One long side of the backyard is along his house , so he will need to

fence only 3 sides only 3 sides , how many yards of fencing will Michael need ?

A. 38

B. 54

C. 60

D. 75

Answer: B

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22. What is the y- intercept of the line by the equation $7x - 3y = 21$?

A. -7

B. $-\frac{7}{3}$

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

D. 7

Answer: D

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23. On april 8 th , a flower at Blooming Acres Florist was 15.0 centimeters tall . On April 16 th flower was 17.4 Centimeters tall .If the flower grew at a constant rate , on what day was the flower 16.5 Centimeters tall?

A. April 11 th

B. April 12 th

C. April 13 th

D. April 14 th

Answer: B

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24. Which of the following experessions is equivalent to the expression given below ?

$$(2x^3 - x - 1) - 3(x^4 + 2x^3 - 2x^2 - x - 3)$$

A. $x^{14} - 3$

B. $-3x^{14}$

C. $-3x^4 + 8x^3 - 6x^2 - 4x + 8$

D. $-3x^4 + 4x^3 - 2x^2 - 2x - 3$

Answer: D

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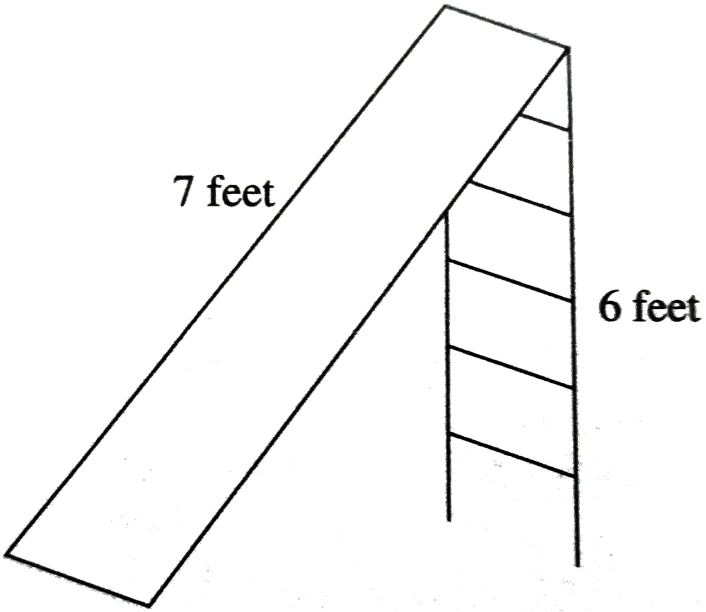
25. The playground equipment shown below has a ladder that is 6 feet tall a diagonal slide that is 7 feet long . If the ladder makes a right angle with the ground , approximately how many feet is the base of the slide from th base

of the ladder ?



A. 2

B. 4

C. 6

D. 8

Answer: B

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26. In date set of 5 points, the mean , median , and mode are each equal to 8 . Which of the following could be the date set ?

A. $\{5, 7, 8, 8, 12\}$

B. $\{7, 7, 8, 8, 12\}$

C. $7, 8, 8, 8, 12\}$

D. $\{7, 8, 8, 10, 12\}$

Answer: A

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27. In a certain sequence of numbers, each term after the 1 st term is the result of adding 2 to the previous term and multiplying that sum by 3 . If the 4th term in the sequence is 186 , what is the 2 nd term ?

A. 2

B. 4

C. 18

D. 60

Answer: C

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28. Which of the following values of x does NOT satisfy the inequality $|x - 3| \geq 12$?

A. -15

B. -12

C. -9

D. 9

Answer: D

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29. For all real numbers s,t,u and v such that s+t +u = 29 and s < v, which of the following statement is true ?

A. s+t+vlt29

B. t+u+v gt29

C. s+t+v=29

D. s+t+v=29

Answer: D

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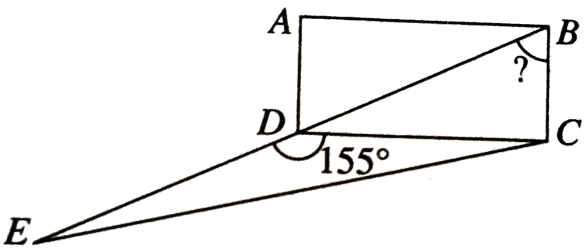
30. In the figure below ,rectangle ABCD shares $\overline{CD}$ with ΔCDE diagonal $\overline{BD}$ of the rectangle extends in a straight line beyond D to E create $\overline{DE}$, and the measure of $\angle CDE$ is

155° . What is the measure of $\angle CBD$



A. 25

B. 55

C. 65

D. 90

Answer: A

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31. If a,b,and c are positive prime numbers , in the equation a-b=c, either b or c must represent which number ?

A. 13

B. 11

C. 7

D. 5

Answer: D

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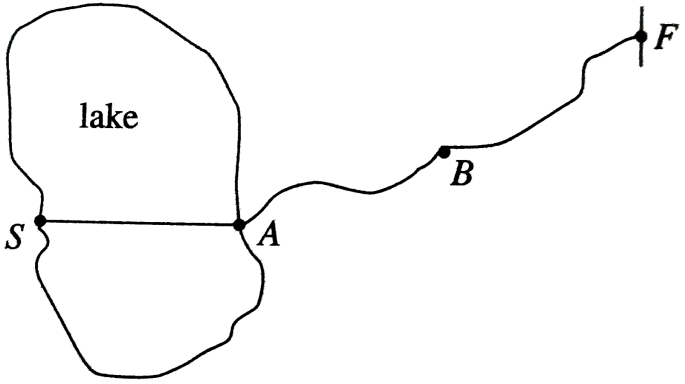
32. Pierre competes in a triathlon along a course as shown in the figure below , He begins swimming at starting point S and swims straight across the lake , gets on his bicycle at station A, bikes to station B, and them runs to finishing line F. The judges use a stopwatch to record his elapsed times of t_A, t_B and t_F hours from point S to points A,B , and F , respectively .If the distance , in miles , between points S and A along the

racecourse is denoted by SA, then what is pierre 's average speed for this race , in miles per hour?



A. $\frac{SA}{T_A}$

B. $\frac{SB}{T_B}$

C. $\frac{SF}{T_F}$

D. $\frac{SA}{T_F}$

Answer: B

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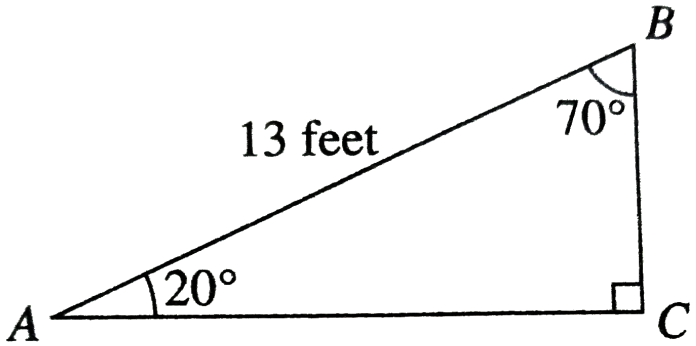
33. The triangle shown below has a hypotenuse with a length of 13 feet . The measure of $\angle A$ is 20° and the measure of $\angle B$ is 70° . Which of the following is closest to the length , in feet , of $\overline{BC}$

(Note : $\sin 70^\circ \approx 0.9397$

$\cos 70^\circ \approx 0.3420$

$\tan 70^\circ \approx 2.747$)



A. 4.4

B. 5.0

C. 12.0

D. 12.2

Answer: D

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34. What is the value of $\frac{8}{y^2} - \frac{x^2}{y}$ when =-3 and y=-4 ?

A. $-\frac{11}{4}$

B. $-\frac{7}{4}$

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

D. $\frac{11}{4}$

Answer: D

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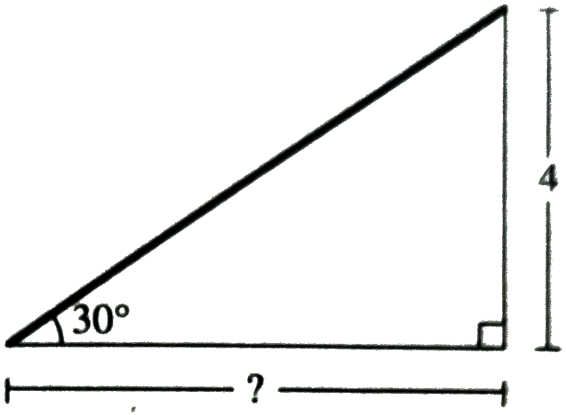
35. As shown in the figure below , with angles as marked ,a ramp is being designed that will have a vertical height of 4 feet . Which of the following is closest to the horizontal length of

the ramp , in feet ?



A. 5

B. 6

C. 7

D. 8

Answer: C

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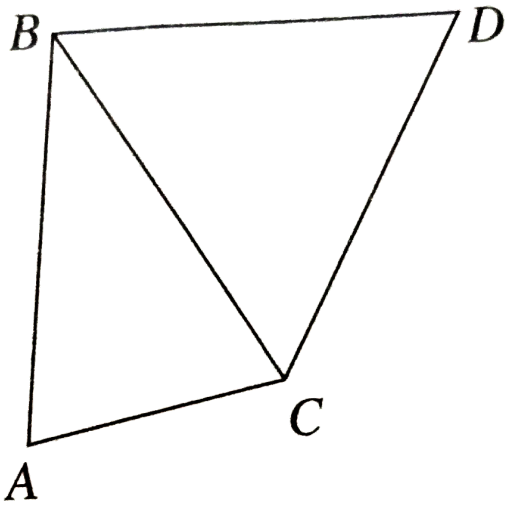
36. In the diagram below ,ΔABC is isosceles and ΔBCD is equilateral . $\overline{AB} = \overline{BC}$ and the measure of $\angle ABC$ is half the measure of

$\angle BAC$. what is the measure of $\angle ABD$?



A. 36°

B. 60°

C. 72°

D. 96°

Answer: D

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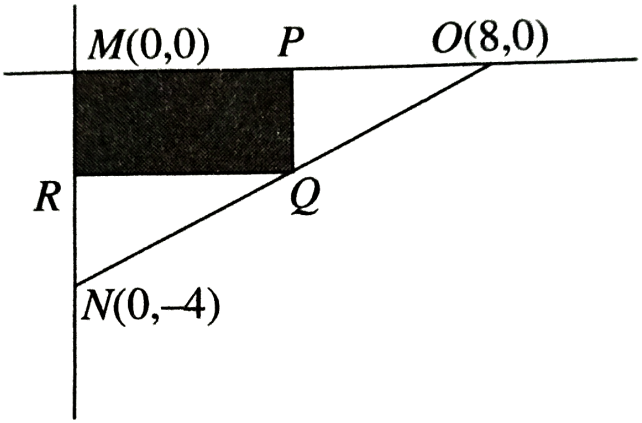
37. The coordinates of the vertices of ΔMON are shown in the standard (x,y) coordination plane below . Rectangle MPQR is shown shaded . Point P lies on $\overline{MO}$, point Q lies on $\overline{MN}$



What is the slope of $\overline{ON}$?

A. -2

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

C. 0

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

Answer: A

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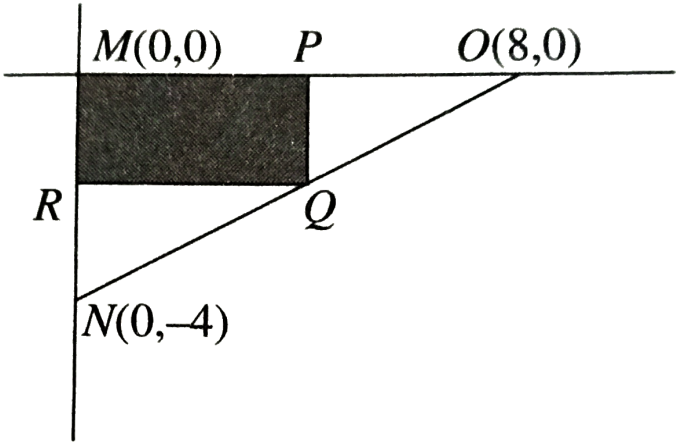
38. The coordinates of the vertices of ΔMON are shown in the standard (x,y) coordination plane below . Rectangle MPQR is shown shaded . Point P lies on $\overline{MO}$, point Q lies on $\overline{MN}$



Which of the following is closest to the perimeter , in coordinate units . of ΔMON?

A. 12.0

B. 16.9

C. 18.0

D. 20.9

Answer: B

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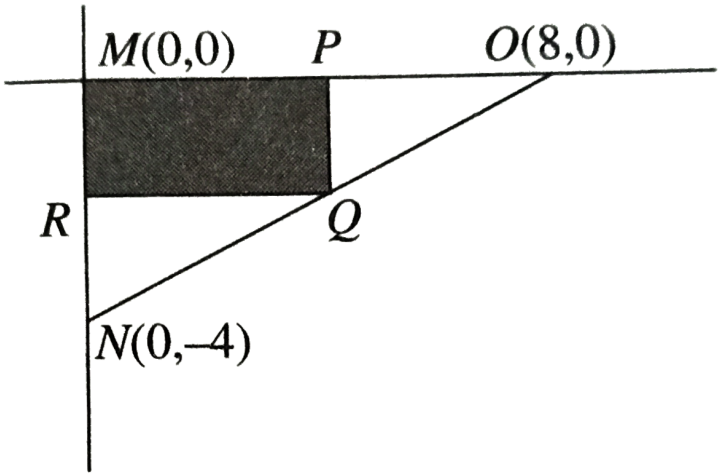
39. The coordinates of the vertices of ΔMON are shown in the standard (x,y) coordination plane below . Rectangle MPQR is shown shaded . Point P lies on $\overline{MO}$, point Q lies on $\overline{MN}$



What is the value of $\cos(\angle MON)$?

A. $\frac{4}{\sqrt{80}}$

B. $\frac{8}{\sqrt{80}}$

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

D. 2

Answer: C

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40. In a Spanish class there are m students , of which n did NOT pass the last exam . Which of the following is a general expression for the

fraction of the class that did receive a passing grade ?

A. $\frac{m-n}{m}$

B. $\frac{m}{n}$

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

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

Answer: A

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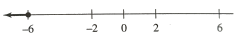
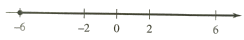
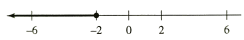
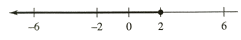
41. The solution set of $5x + 9 \geq 2(3x + 4) + 7$ is shown by which of the following number line graphs ?

A. 

B. 

C. 

D. 

Answer: A

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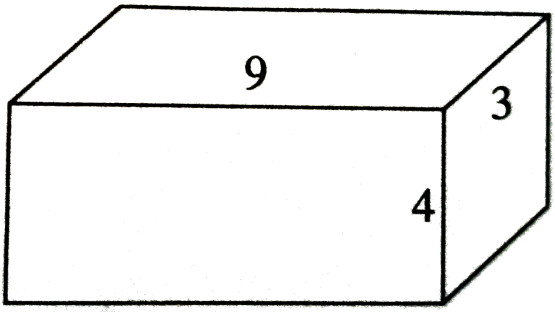
42. An artist wants to cover the entire outside of a rectangular box with mosaic tiles . The dimensions of the box shown below are given in centimeters . If each tile is exactly one square centimeters, and the artist lays the tiles with no apace between them , how many tiles will he need ?



A. 75

B. 96

C. 108

D. 150

Answer: D

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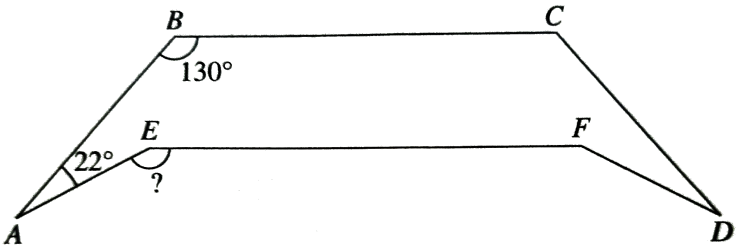
43. In the figure shown below ,$\overline{BC}$ and bar(EF) $areparal \leq l$ and bar(AE) = bar(FD) . if angle ABC is130 ^(@) and angle (BAE)is22^@

, $\hat{wi}sthemeasureofa$ngle (AEF)` ?



A. 50°

B. 118°

C. 152°

D. 158°

Answer: D

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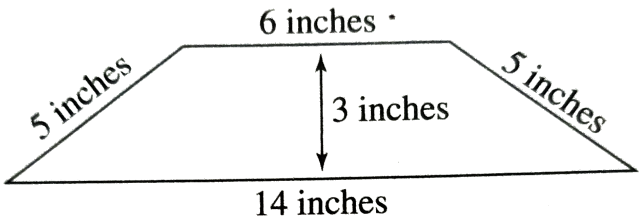
44. Given the figure below , what is the area of the trapezoid , in square inches ?



A. 18

B. 30

C. 42

D. 50

Answer: B

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45. What is the solution set $\sqrt[5]{x^2 + 4x} = 2$?

A. $\{4\}$

B. $\{8\}$

C. $\{-4, 8\}$

D. $\{-8, 4\}$

Answer: D

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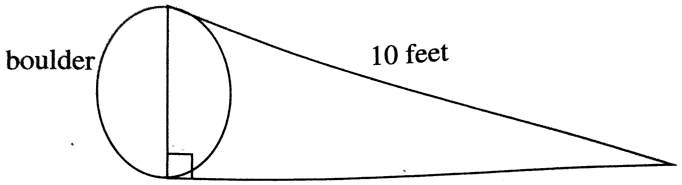
46. As shown in the figure below , a skatebond ramp leading from the top of a boulder is 10 feet long and forms a 32° angle with the level ground . Which of the following expressions represents the height, in the feet , of the boulder ?



A. $10\tan 32^\circ$

B. $\dfrac{\sin 32^\circ}{10}$

C. $\frac{10}{\cos 32^\circ}$

D. $10\sin 32^\circ$

Answer: C

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47. The 4 integers j,j,k and n have an average of 0. which of the following equations must be true ?

A. $k = n$

B. $k = -j$

C. $k + n = -2j$

D. $k + n = 0$

Answer: C

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48. IF $f(x) = \sqrt{x}$ and the composite function f(g(x))=$\sqrt{4x^2 - 5}$, which of the following could be g(x) ?

A. $\sqrt{4x^4 - 5}$

B. $\sqrt{16x^4 - 25}$

C. $2x^2 - 25$

D. $4x^2 - 5$

Answer: D

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49. In the qualifying rounds for a race , Rusty and Date drive theif cars around a 6,000 - foot oval track . Rusty and Dale each drive 8 laps in

the qualifying rounds in lanes of identical length .

on day one of the qualifying rounds , Rusty and Dale start from the same point , but their cars are reversed and each drives opposite ways , Rusty drives at a constant speed that is 8 feet per second faster than dale's constant speed Rusty passes Dale for the first time in 150 seconds . Rusty drives at a constant rate of how many feet per second ?

A. 16

B. 20

C. 24

D. 32

Answer: B

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50. In the qualifying rounds for a race , Rusty and Date drive theif cars around a 6,000 - foot oval track . Rusty and Dale each drive 8 laps in the qualifying rounds in lanes of identical length .

On the second day of the qualifying rounds , Rusty averages 180 seconds per lap until he begings the last lap . He then goes into a lower gear . He averages 190 seconds per lap for this qualifying round . How many seconds does Rusty take to drive the final lap ?

A. 155

B. 160

C. 260

D. 200

Answer: C

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51. In the qualifying rounds for a race , Rusty and Date drive theif cars around a 6,000 - foot oval track . Rusty and Dale each drive 8 laps in the qualifying rounds in lanes of identical length .

Dale drives 6 laps in 90 mintues . At what average rate , in feet per hour , does Dale drive these 6 laps?

A. 400

B. $5,400$

C. $10,000$

D. $24,000$

Answer: D

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52. Circle A has its center at point (-5,2) with a radius of 2 , and circle B is represented by the equation $(x+4)^2+(y-2)^2=9$. Where is point (-2,2) located ?

A. inside circle A only

B. Inside circle B only

C. Inside both circle A and circle B

D. Outside both circle A and circle B

Answer: B

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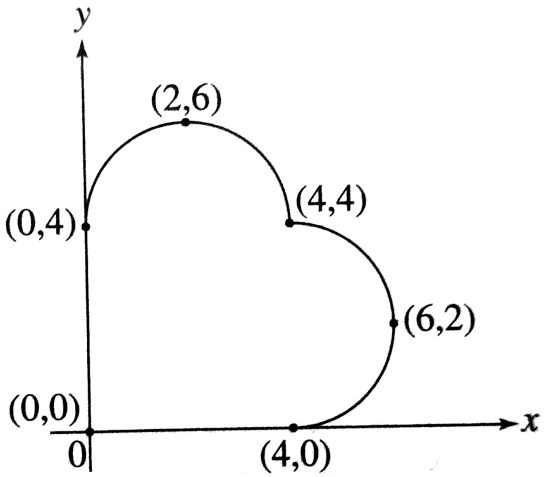
53. A heart - shaped ornement is made from a square and two semicircles , earch of whose diameter is a side of the square the ornament

is shown in the standard (x,y) coordinate plane below , where 1 coordinate unit represents 1 inch the coordinate of six points on the border of the ornament are given . what is the perimeter , in inches , of the ornament ?



A. $4 + 2\pi$

B. $8 + 4\pi$

C. $8 + 8\pi$

D. $16 + 4\pi$

Answer: A

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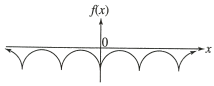
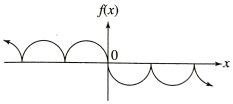
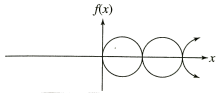
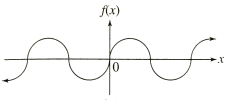
54. A function f(x) is defined as even if and only if $f(x) = f(-x)$ for all real values of x. Which one of the following graphs represents an even function f(x) ?

A. 

B. 

C. 

D. 

Answer: A

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55. In the standard (x,y) coordinate plane , point A is located at $(w, w+5)$ and point B is

located at $(4w, w-5)$. In coordinate units , what is the distance between A and B ?

A. $\sqrt{9w^2+2w+10}$

B. $\sqrt{9w^2+100}$

C. $9w^2+100$

D. $|w|\sqrt{11}$

Answer: D

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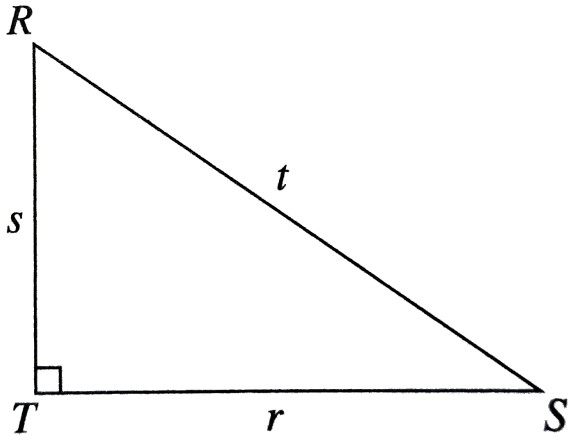
56. RST is a right triangle with side lengths of r,s, and t, as shown below what is the value of $\cos^2 S + \cos^2 R$?



A. 1

B. $\sqrt{2}$

C. $\sqrt{3}$

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

Answer: A

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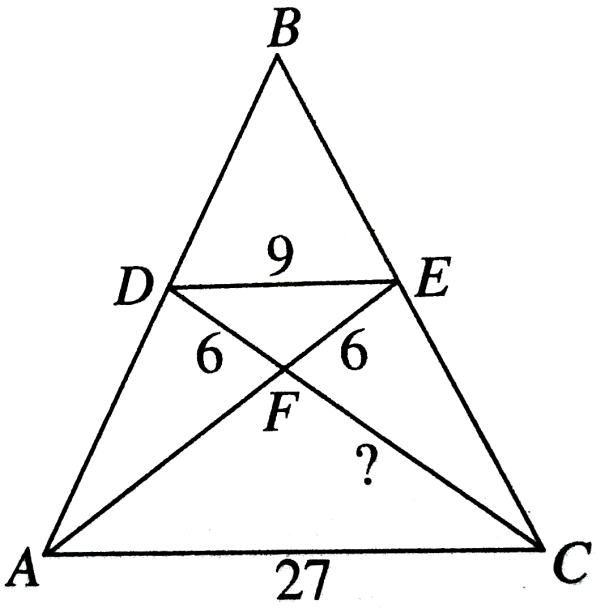
57. In isosceles triangle ABC below , the measures of $\angle BAC$ and $\angle BCA$ are equal and $\overline{DE} \mid \mid \overline{AC}$.The diagonals of trapeziod DECA intersect at F . The length of $\overline{DE}$ is 9 centimeters , and the length of $\overline{AC}$ is 27 centimeters . what is the length , in

centimeters , of $\overline{FC}$?



A. 12

B. 15

C. 18

D. 33

Answer: A

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58. Which of the following represents the product of the matrices below ?

$$\begin{bmatrix} 4 & -2 \\ 3 & -6 \end{bmatrix} \times \begin{bmatrix} 0 \\ 2 \end{bmatrix}$$

A. $\begin{bmatrix} -4 \\ -12 \end{bmatrix}$

B. $\begin{bmatrix} -12 \\ \hline 0 \end{bmatrix}$

C. $[-6]$

D. $[6-12]$

Answer: A

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59. If $\frac{(n+1)!}{(n-1)!} = 20,$ then $n! = ?$

A. 6

B. 10

C. 12

D. 24

Answer: D

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60. What is the ratio of a circle's Radius to its circumference?

A. $2\pi : 1$

B. $1 : 2\pi$

C. $\pi : 1$

D. $1:\pi$

Answer: B

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