MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

SAT MATH STRATEGIES

Example

1. The perimeter of a rectangle is 10 times as great as its width. Thelength of the rectangle is how many times as great as the width of the rectangle?

A. One-Half

B. two

C. three

D. four

Answer: D

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2. The current value of a stock is 20% less than its value when it was purchased. By what percent must the current value of the stock rise in order for the stock to have its original value?

A. 20

B. 25

C. 30

D. 40

Answer: B

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3. Fred Gives $\dfrac{1}{3}$ of his DVDs to Andy and then given $\dfrac{3}{4}$ of the remaining DVDs to jerry. Fred now has what fraction of the original number of DVDs?
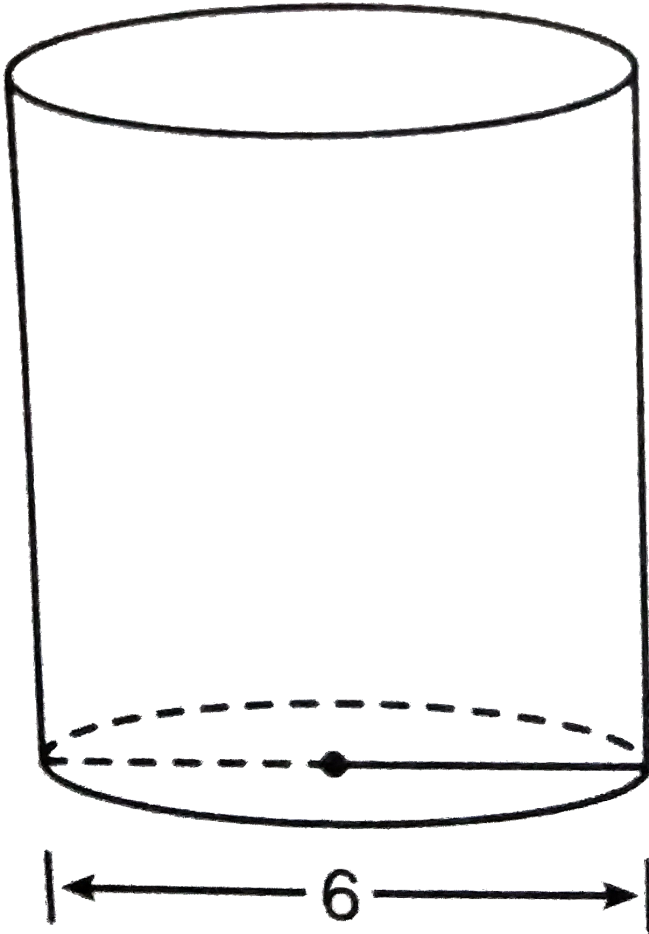
A. $\dfrac{1}{12}$

B. $\dfrac{1}{6}$

C. $\dfrac{1}{4}$

D. $\dfrac{1}{3}$

Answer: B

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|←————— 6 —————→|

4.

The diameter of the base of a right circular cylinder is 6

and the distance from the centre of a base to a point

on the circumference of the other base is 8 what is the height of the cylinder?

A. 2

B. 10

C. $\sqrt{10}$

D. $\sqrt{55}$

Answer: D

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5. When a positive interger k is divided by 5, the remainder is 3. what is the remainder when 3k is

divided by 5?

6. If p and q are intergers such that $6 < q < 17$ and $\frac{p}{q} = \frac{3}{4}$, how many possible values are there for p?

A. two

B. three

C. four

D. five

Answer: B

7. Which expression is equivalent to $i + i^{99}$ where $i = \sqrt{-1}$?

   A. $i - 1$

   B. $i + 1$

   C. 0

   D. $2i$

Answer: C

8. The first two terms of an ordered sequence of positve integers are 1 and 3. if each number of the sequence after 3 is obtained by adding the two numbers immediately precedingit, how many the first 1,000 numbers in this sequence are even?
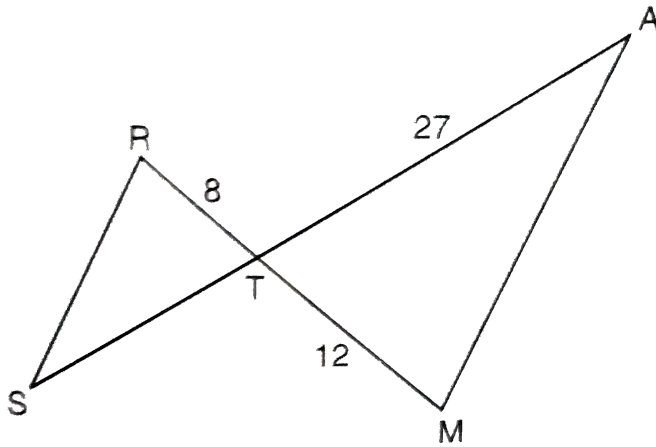
9. The trip odometer of an automobile improperly displays only 3 miles for every 4 miles actually driven. If the trip odometer shows 42 miles, how many mileshas the automobile actually been driven?

10.

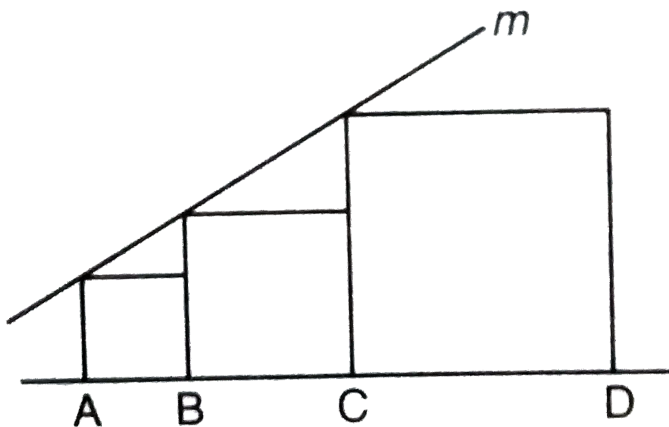In the figure abive, $\overline{RSAM}$ and segment SA intersects segment MR at 7. what is the length of AS?

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11.

Linem intersects the conrner points of three adjacent squares as shown in the above figrue. If AB=5 and BC=8, what is the length of $\overline{CD}$?

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12. $y \leq 3x + 1$

$x - y > 1$,brgt Which ordered pair is in the set of all

ordered pairs that satisfy the above system of inequalities?

A. $(-1, -2)$

B. $(2, -1)$

C. $(1, 2)$

D. $(-1, 2)$

Answer: B

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13. When 5 is divided by a number, the result is 3 more than 7 dividedby twice the number. What is the

number?

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

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

C. 1

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

Answer: B

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14. A yoga studio charges a one-time registration fee of $75 plus montly membership fee of $45. if the montly fee is subject to a sales tax of 6%, which of the

following expressions represents the total cost of membership for n months?

A. $(45 \times 1.06 \times 75)n$

B. $45(1.06)n + 75$

C. $(75 + 45)(0.06) + 45n$

D. $(45 + 0.06)n + 75$

Answer: B

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15. The expression $\dfrac{7y - 3}{y + 2}$ is equivalent to which of the following?

A. $7 - \dfrac{3}{2y}$

B. $\dfrac{7-3}{3y}$

C. $7 - \dfrac{17}{y+2}$

D. $7 - \dfrac{3}{y+2}$

Answer: C

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16. Every 8 days a mass of a certain radioactive substance decreases to exactly one-half of its value at the beginning of the 8day period. If the initial amount of the radioactivce substance is 75 grams, which

equation gives the number of grams in the mass, M,that remains after d days?

A. $M = 75\left(\dfrac{d}{16}\right)$

B. $M = 75\left(\dfrac{8}{d}\right)^2$

C. $M = 75\left(\dfrac{1}{2}\right)^{8d}$

D. $M = 75\left(\dfrac{1}{2}\right)^{\frac{d}{8}}$

Answer: D

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17. if t ties cost d dollars, how many dollars would t+1 ties cost?

A. $d + 1$

B. $\dfrac{dt}{t + 1}$

C. $\dfrac{d + t}{t + 1}$

D. $\dfrac{d(t + 1)}{t}$

Answer: D

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18. Theelement copperhas a density of 8.9grams per cubic centimeter. What is the number of cubic centimetersin the vlume of 3.1kilograms of coppe? [density =mass divided by volume]

A. 287.1

B. 348.3

C. 391.4

D. 418.6

Answer: B

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19. Andrea finished herr firsthalf-merathon race of 13.1 miles in$2\dfrac{1}{2}$ hours. Ifshe ran the race at a constant rateof speed, how many minutes did it take her to run the first 2 miles?

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20. The equation above represents the cost in dollars, C, of a cable television subscription that includes n premiium high-definition channels. Acording to the model, what is the meaning of the constant 65 in the equation?

    A. The cost of a cable subscription that includes 9 premium channels.

    B. The cost of a cable subscription that does not include any premium channels.

    C. The cost of adding on 9 premium channels to the cost of the cable subscription

D. The amount the cost of a cable subscription increases when one additional premium channel is ordered.

Answer: B

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21. Connor invests a sum of money at an interest rate of 3% per year compounded annually. The value of the investment, y, after n years can be calculated using the equation $y = A(x)^n$. If Connor invests $250 and wants to calculate the value of his investment after 10 years,

assuming no further deposits or withdrawals, which of the following equations should be use?

A. $y = 250(0.97)^{10}$

B. $y = (250 \times 0.03)^{10}$

C. $y = 250(0.03)^{10}$

D. $y = 250(1.03)^{10}$

Answer: D

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22. If $(x + 9)(x + a) = x^2 + 9b + 6)x + 45$ is true for all values of x, what is the value of b?

23. $p = 3n(5n - 2)$

$q = 4(2 - 5n)$

If p-q=$ax^2 = bx + c$ for all values of x where a,b and c

are constants, what is the value of c?

   A. -8

   B. -4

   C. 4

   D. 8

Answer: A

24. $(ax + 4)(bx - 1) = 21x^2 + kx - 4$

If the equation above is true for all values of x and a+b=10, what are the possible values for the constant k?

A. 8 and 14

B. 5 and 25

C. 9 and 15

D. 19 and 31

Answer: B

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25. if 3w+4=25, what is the value of 4w+3?

26. If $6\left(\dfrac{x}{y}\right) = 4$, then $\dfrac{1}{3}\left(\dfrac{y}{x}\right) =$

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

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

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

D. 2

Answer: A

27. if $\dfrac{8}{n} = \dfrac{20}{n+9}$, what is the value of $\dfrac{n}{8}$?

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

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

C. 4

D. 12

Answer: B

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28. if 3x-7=9, what is the value of 6x+5?

A. 26

B. 29

C. 33

D. 37

Answer: D

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29. if $7 - 2k \le 3$, what si the least possible value of

2k+7?

A. -3

B. 10

C. 11

D. 13

Answer: C

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30. last week, Ben, Kaltiyn, and Emily sent a total of 394 text messages from their cell phones. Kaitlyn sent 50% moer text messages than Ben, and Ben sent 30 fewer messages than emily. How many text message did kaitlyn send?

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31. An exterminator needs to dilute a 25% solution of an insecticide with a 15% solution of the same insecticide. How many more liters of the 25% solution that the 15% solution are needed to make a total of 80 liters of a 22% solution of the insecticide?

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32. If $\dfrac{h}{p} = 28$ and $p = \dfrac{3}{4}$, what is the value of $\dfrac{1}{3}h$?

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33. $\dfrac{x-9}{x+y} = \dfrac{1}{2}$

$\dfrac{x}{y} - 1 = 3$

Bsed on the system of equations above, what is the value of x+y?

   A. 18

   B. 24

   C. 27

   D. 30

Answer: D

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34. $2x^2 + y^2 = 176$

$y + 3x = 0$

If (x,y) is a solution to the system of equatios above, what is the value of y^2?

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35. If $2s - e = 32$ and $2e - d = 10$, what is the average of d and e?

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36. if x-y=y+3=7, what is the value of x?

A. -4

B. 8

C. 10

D. 11

Answer: D

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37. If 3u+w=7 and 3k-9u=2, what is the value of w+k?

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38. If $(p + q)^2 = 78$ and $(p - q)^2 = 50$, what is the value of pq?

39. if 2x-3y=10, what is the value of $\dfrac{4^x}{8^y}$?

A. $\left(\dfrac{1}{2}\right)^{10}$

B. 2^{10}

C. 4^6

D. 8^5

Answer: B

40. If $\dfrac{1}{2}a + \dfrac{2}{3}b = 5$, what is the value of 3a+4b?

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41. A population of rabbits doubles every 48 deays according to the formula $P = 10(2)^{\frac{t}{48}}$, where P is the population of rabbits on day t. what is the value of r when the population of rabbits is 320?

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42. if p and q satisfy $2y^2 + y21$ and $p > q$, which of the following is the value of p-q?

A. $\dfrac{15}{2}$

B. $\dfrac{13}{2}$

C. $\dfrac{7}{2}$

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

Answer: B

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43. An acute angle of a right triangle measures x radians. Which of the following is equal to cosx when

$x = \dfrac{\pi}{9}$?

A. $-\cos\left(\dfrac{11\pi}{18}\right)$

B. $-\sin\left(\dfrac{\pi}{9}\right)$

C. $\sin\left(\dfrac{8\pi}{9}\right)$

D. $\sin\left(\dfrac{7\pi}{18}\right)$

Answer: D

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44.

$\left(2 - \sqrt{-9}\right)\left(1 + \sqrt{-16}\right) = x + yi \qquad \left(\text{Note: } i = \sqrt{-1}\right)$

In the equation above, what is the value of y?

45.
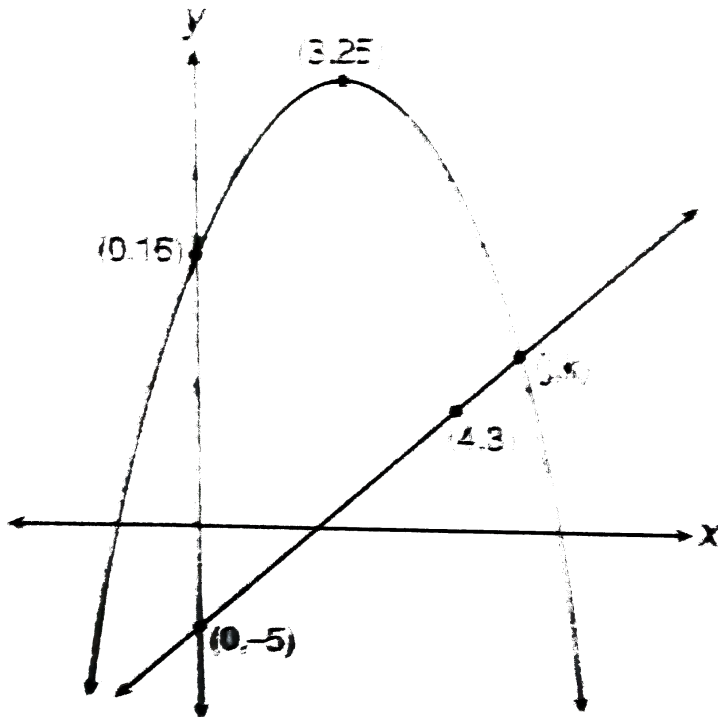
a quandratic function and a linear function are graphed

in the xy-plane as shown above. The vertex of the graph

of the quadratic function is at (3,25). If the two graphs

intersect in the first quadrant at the point (j,k) what is the value of the product jk?

46. If function h is defined by h(x)= $ax^2 - 7$ and $h(-3) = 29$, what is $h\left(\dfrac{1}{2}\right)$?

A. -6

B. -5

C. 4

D. 8

Answer: A

47. if functionn f is defined by $f(x) = 3x - 4$, then

$f(-2x)=$

    A. $-6x + 4$

    B. $8 - 6x$

    C. $-6x - 4$

    D. $8x + 6x^2$

Answer: C
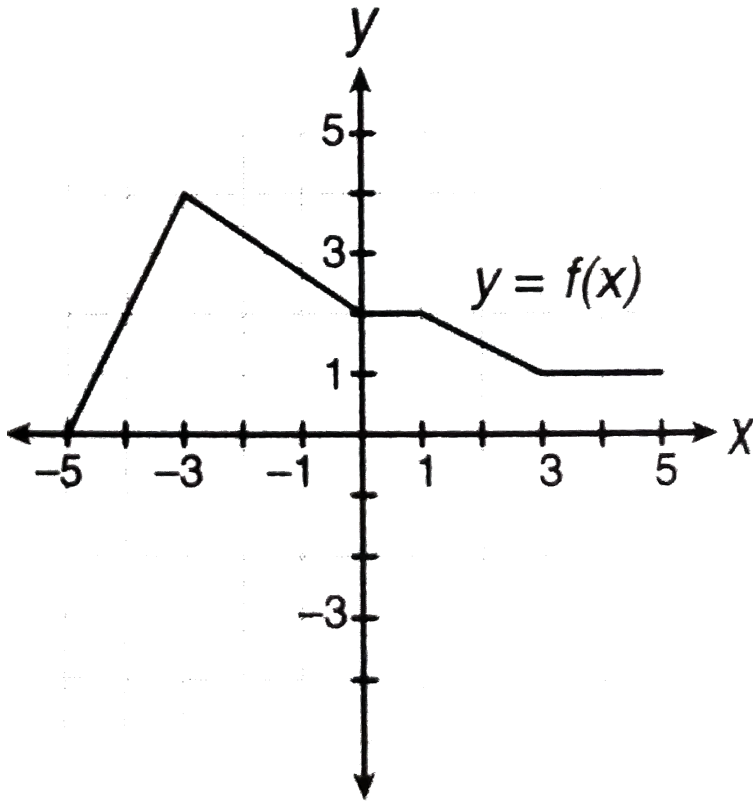
48.

The graph of function f over the interval $-5 \le x \le 5$ is shown I the figure sbove. If $f(w) = 2$ and $w > 0$, what is one possible value of w?

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49. Based on the graph in the previous example, which of the following statements must be true

I. $f(5) + f(- 5) = 0$.

(II. 9f $- 5 < x < 5$, the maximum value of function f is 4.

III. The quation f(x)=3 has 3 real solution.

A. I only

B. II only

C. I and II only

D. II and III only

Answer: B

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x	-1	1	3	5
$f(x)$	5	-1	-7	-13

50.

The table above shows a few values of the linear function f. which of the following equations defines f?

A. $f(x) = 2x - 3$

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

C. $f(x) = -3x + 2$

D. $f(x) = 3x - 2$

Answer: C

51. Functiuon g is related to function f by the equation $g(x) = f(x - 1) - 2$. If the point (4,3) is on the graph of function f, what are the coordinates of the corresponding point on the graph of function g?

A. (3,1)

B. (5,1)

C. (1,3)

D. (1,5)

Answer: B

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52. $g(x) = 2^x$

$h(x) = 8x^2$

if functions g and h are defined in the above equations,
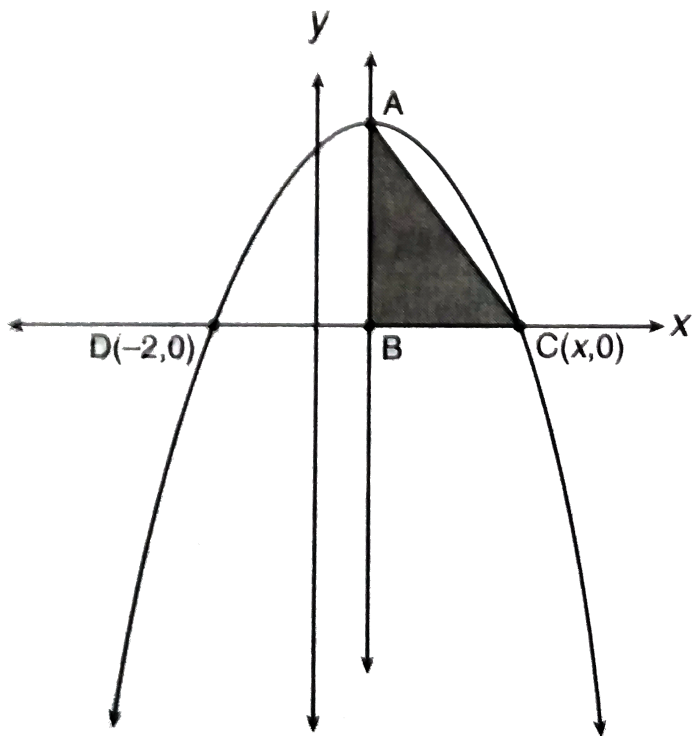
what is the value of $g(h(3))$?

53. A parabola $y = ax^2 + bx + c$ with $a > 0$ passes

through the points (-2,3)(pq), and (5,3). If (p,q) is the

lowest point on the parabola, what is the value of p?

y

A

D(−2,0) B C(x,0) X

Note: Figure not drawn to scale.

54.

the graph of $f(x) = -0.5x^2 + x + 4$ in the xy-plane

is the parabola shownn in the figure above. The

parabola crosses the x-axis at D(-2,0) and at point C(x,0).

Point A is the vertex of the parabola. Segment AC and

theline of symmetry, $\overline{AB}$, are drawn. what is the

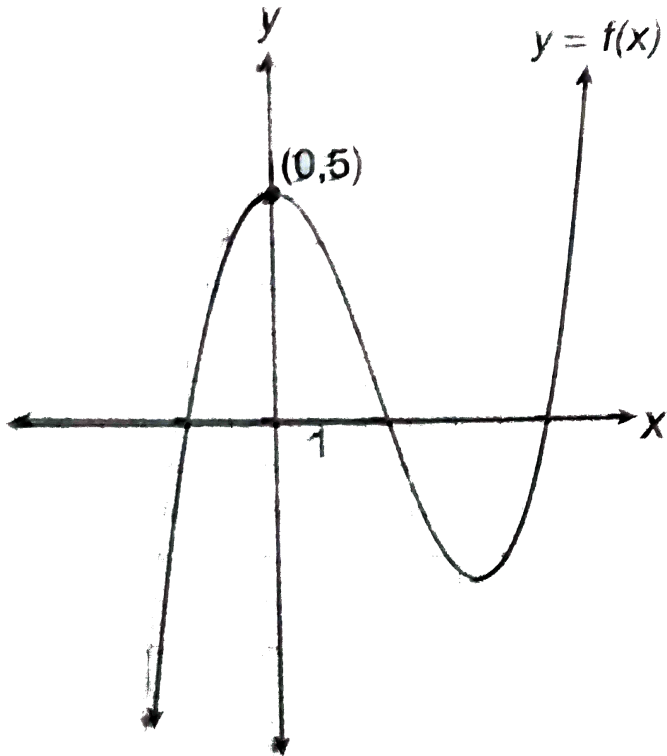number of square units in the area of $\triangle ABC$?

A. 4.5

B. 6.25

C. 6.75

D. 13.5

Answer: C

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55.

I. f9x) is divisible by x-.

II in the interval O $< x < 6$, exactly oe x-value satisfies

the equation f(x)=5

III. (x+2) is a factor of f(x).

The diagram above shows the graph of a polynomial

function f. which statement or state-ments int he box above must be true?

A. II only

B. III only

C. I and II only

D. II and III only

Answer: D

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56. $p(x) = 4\big(-x^3 + 11x + 12 \big) - 6(x - c)$

In the polynomial function p(x) defined above c is a

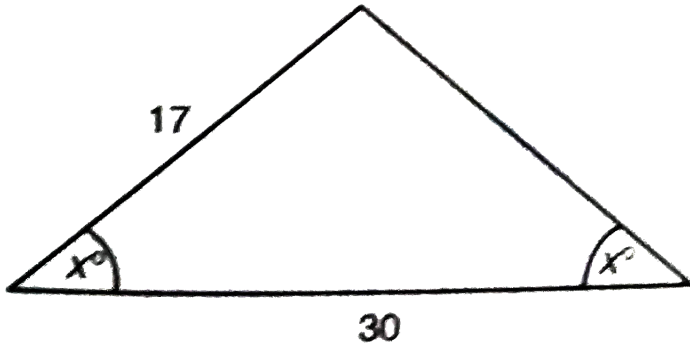constant. If p(x) is divisible by x, what is the value of c?

A. -8

B. -6

C. 0

D. 6

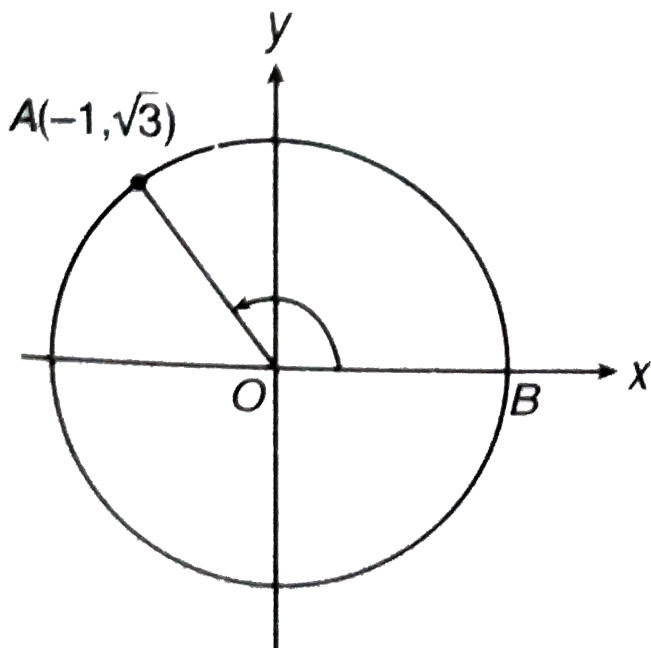**Answer: A**

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57.

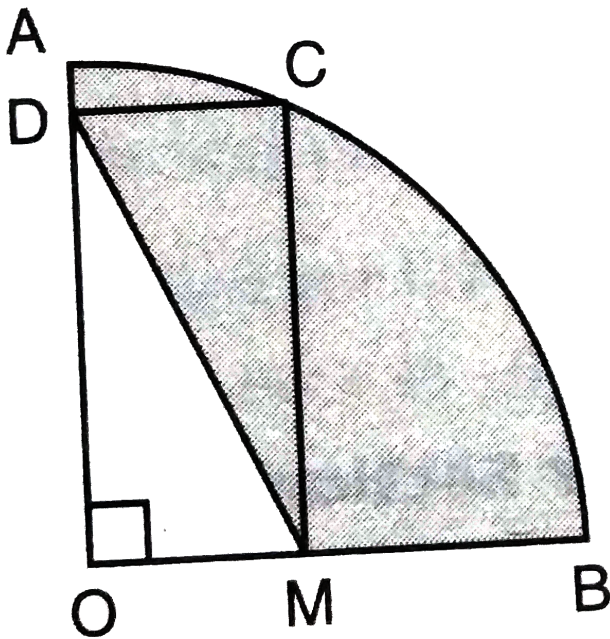In the figure above, what is the value of cosx-sinx?

A(−1,√3)

58.

In the xy-plane above, O is the center of the circle, and

the measure of $\angle AOB$ is $k\pi$ radians. What is a possible

value for k?

A

D

C

O

M

B

59.

the figure above shows a quarter of a circle with center

at O. if the length of diagonal $\overline{DM}$ of rectangle ODCM

is 8 and M is the midpoint of $\overline{OB}$, what is the area of

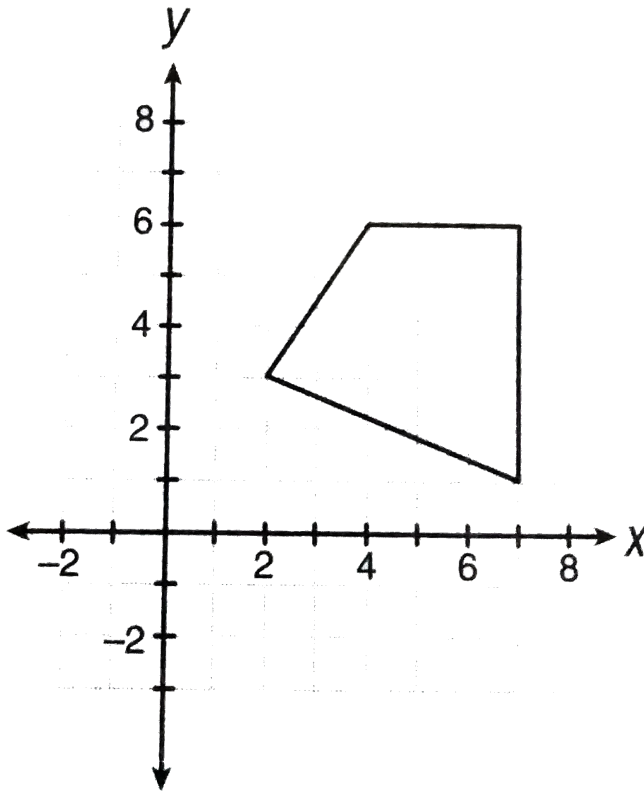the shaded region?

A. $4\left(4\pi - \sqrt{3}\right)$

B. $8\left(\pi - \sqrt{3}\right)$

C. $8\left(2\pi - \sqrt{3}\right)$

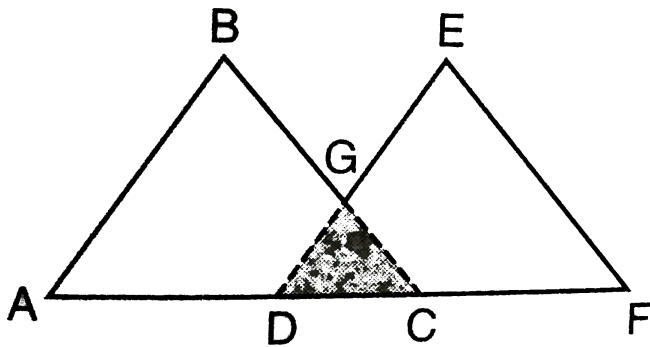D. $16\left(\pi - \sqrt{3}\right)$

Answer: C

60.

what is the number of square units in the area of the quandrilateral shown in the figure above?

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61.

The figure above shows a logo in the shape of overlapping equilateral triangles ABC and DEF. if $AD = DC = CF = 4$, what is the area of the shaded region?

    A. $24\sqrt{3} - 8$

    B. $4\sqrt{3}$

    C. $32\sqrt{3}$

    D. $36\sqrt{3} - 8$

Answer: B

62. If $\sqrt[3]{b^5} \cdot \sqrt[4]{b^3} = \sqrt[3]{b^x}$ for all $b \geq 0$, what is the value

of x?

63. If $\frac{1}{3}r + \frac{1}{4}s = \frac{5}{6}$, what is the value of 4r+3s?

64. $-\dfrac{12}{5} < 6 - 9y < -\dfrac{9}{4}$

In the inequality above, what is one possible value of

$3y - 2$?

    A. 0.75

    B. 0.76

    C. 0.80

    D. 0.81

Answer: B

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65. $3x + 4y = 7$

$kx - 2y = 1$

For what value of k will the above system of equations have no solution?

    A. -3

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

    C. 0

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

Answer: B

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66. $f(x) = (x - 8)(x + 2)$,brgt Which of the following is an equivalent form of the function above in which the minimum value of function f appears in the equation as a constant?

A. $f(x) = x^2 - 16$

B. $f(x) = (x + 3)^2 - 16$

C. $f(x) = (x + 3)^2 - 7$

D. $f(x) = (x - 3)^2 - 25$

Answer: D

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67. A new fitness class was started at a chain of fitness clubs owned by the same company. The scatter plot above shows the total number of people attending the class during the first 5 months in which the class was offered. The line of best fit is drawn. If n is the number of the month, which of the following functions could represent the equation of the graph's line of best fit?

A. $f(x) = 300n + 125$

B. $f(n) = 300 + 125n$

C. $f(n) = 400 + 150n$

D. $f(n) = 200n + 300$

Answer: B

68. In jume, the price of a DVD player that sells for $150 is increased by 10%. In july, the price of the same DVD player is decreased by 10% of its current selling price. What is the new selling price of the DVD player?

A. 140

B. 148.5

C. 150

D. 152.5

Answer: B

69. A certain car is known to deprecitate at a rate of 20% per year. The equation V(n)=p$(x)^n$ can be used to calculate the value of the car, V. after n years where p is the purchase price. If the purchase price of the car is $25,000, to the nearest dollar, howmuch more is the car worth after 2 year than 3 years?

A. 1600

B. 2400

C. 3200

D. 4000

Answer: C

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