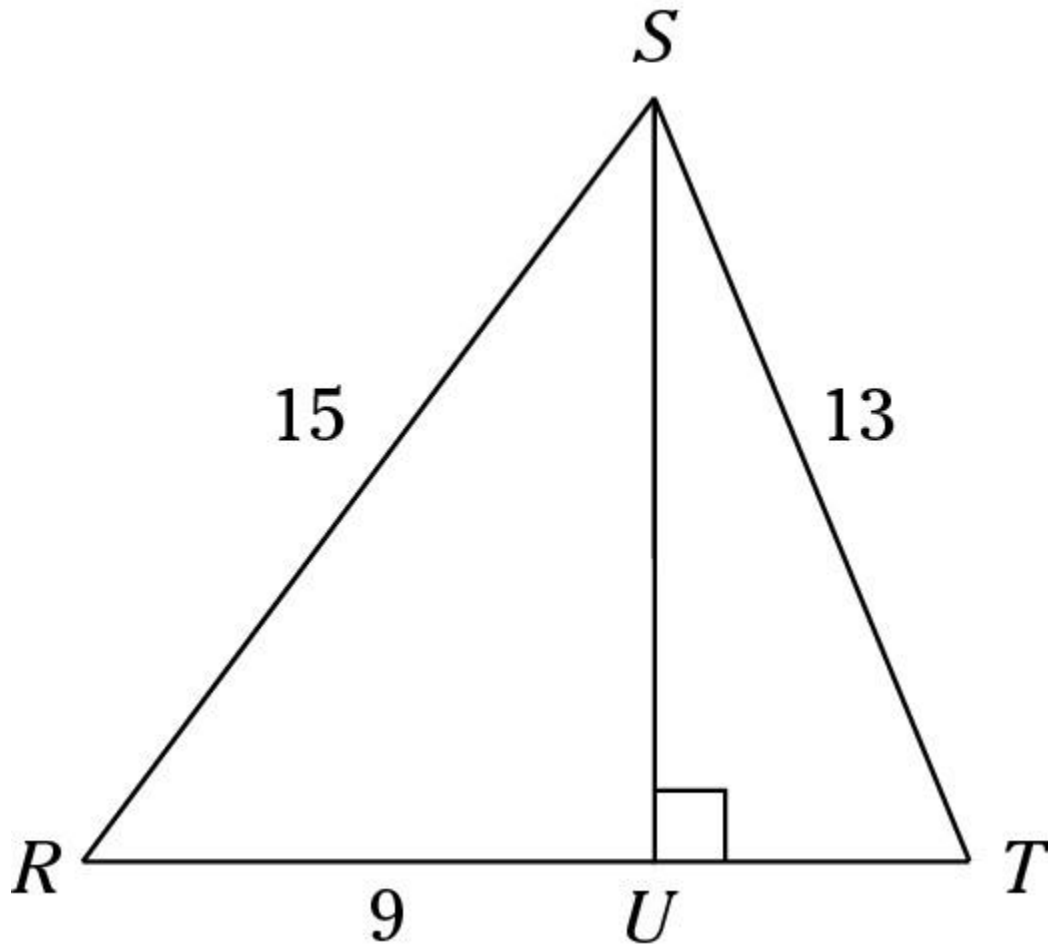


ACT MATH PRACTICE PAPER 8

SET 1

1. What is the area of $\triangle RST$ in the following figure?



A. 84

B. 91

C. 96

D. 105

E. 120

2. Antoine bought a new electric guitar that cost \$588.60 after 9% sales tax was added. What was the price of the guitar without tax?

F. \$536

G. \$540

H. \$542

J. \$545

K. \$548

3. Which of the following points on the xy -graph is the x -intercept of the equation $y = 2x - 8$?

A. (0, 4)

B. $(0, \frac{1}{4})$

C. (4, 0)

D. (-4, 0)

E. $(-\frac{1}{4}, 0)$

4. What is the determinant of the matrix $\begin{vmatrix} 3 & 6 \\ -1 & 2 \end{vmatrix}$?

F. 0

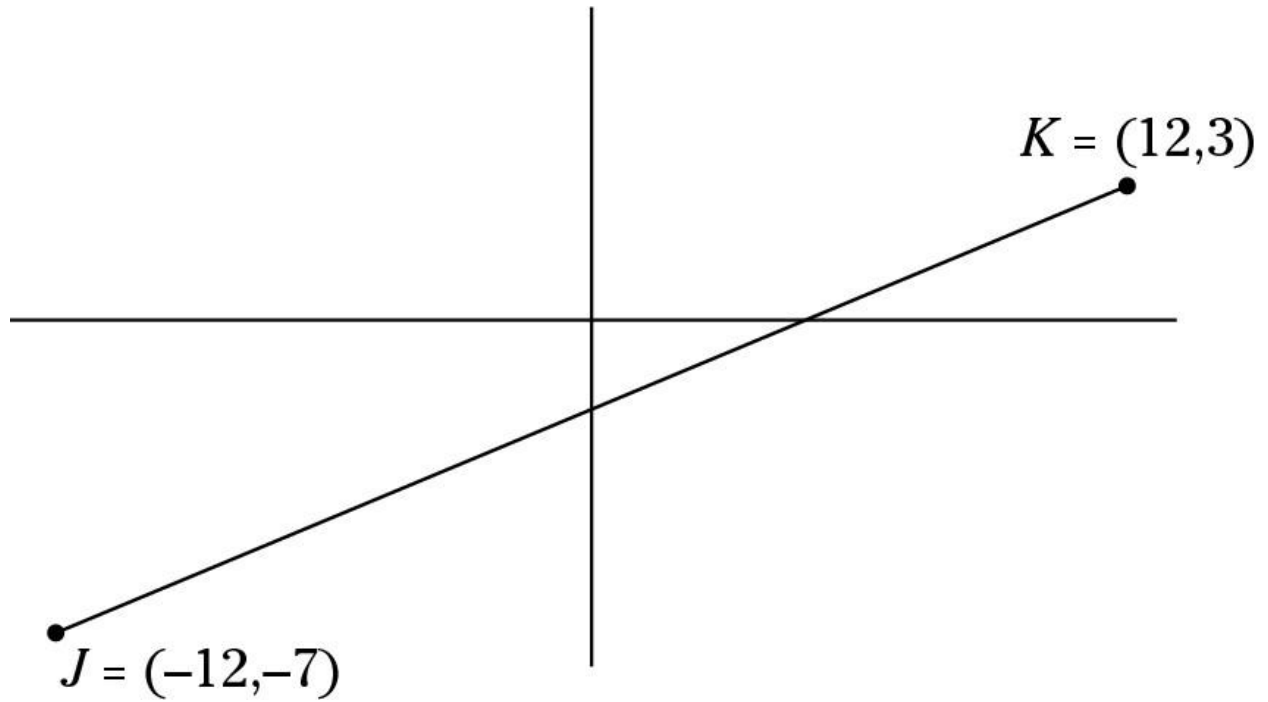
G. 12

H. |0|

J. |6|

K. |12|

5. In the following figure, what is the length of \overline{JK} ?



- A. 24
- B. 25
- C. 26
- D. 27
- E. 28

6. If $\left(\frac{1}{49}\right)^{n+3} = \sqrt{7}$, then $n =$

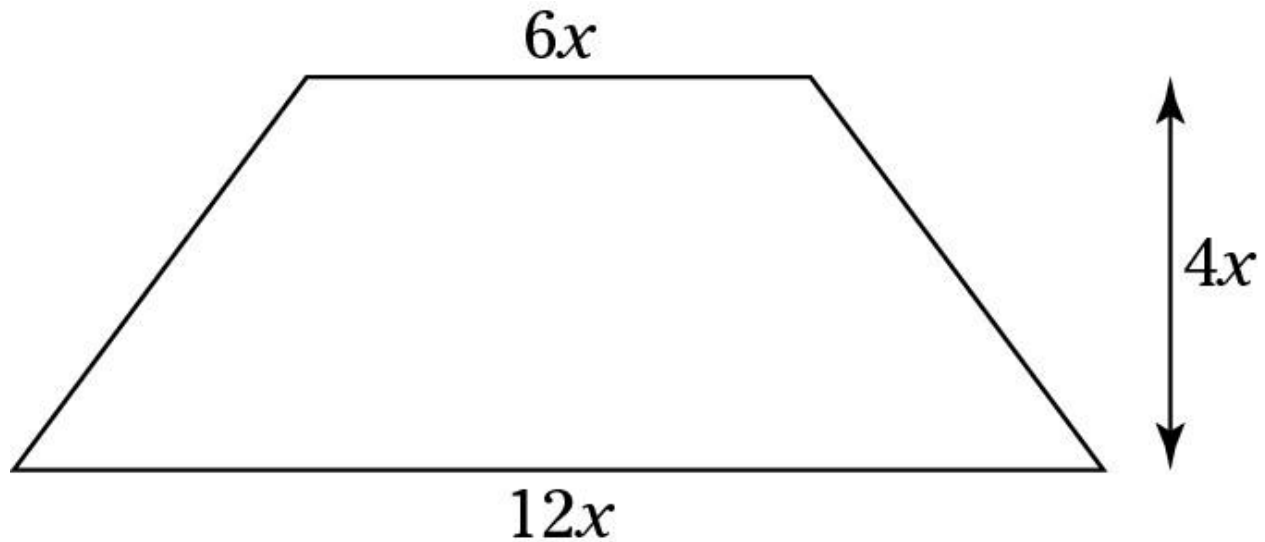
- F. $-\frac{7}{4}$
- G. $\frac{9}{4}$
- H. $-\frac{11}{4}$
- J. $-\frac{13}{4}$
- K. $\frac{15}{4}$

7. A 25-foot ladder stands against a vertical wall at an angle of n degrees with the ground. If $\sin n = \frac{4}{5}$, how far is the base of the ladder from the wall?

- A. 12
- B. 13

- C. 14
- D. 15
- E. 16

8. In the following figure, if the dimensions of the trapezoid are as shown and the area of the trapezoid is 144, what is the value of x ?



- F. 2
- G. 3
- H. 4
- J. 6
- K. 8

9. Ansgar is writing a novel. He writes seven days a week. On each of those days he writes for at least 4 hours but never more than 8 hours. Last week, he wrote for exactly 46 hours. What is the maximum number of days on which he could have written for 8 hours?

- A. 2 days
- B. 3 days
- C. 4 days
- D. 5 days
- E. 6 days

10. Which of the following is a possible value of x if $5x^2 - 10x + 4 = 0$?

F. $2\sqrt{5}$

G. $1+2\sqrt{5}$

H. $1+\frac{\sqrt{5}}{5}$

J. $2+\frac{\sqrt{5}}{10}$

K. $10+\frac{\sqrt{5}}{10}$

11. If you multiply a number by 3 and then add 40, the result is the same as if you first add 17 and then multiply by 2. What is the result if you subtract 9 from the number and then multiply by 4?

A. -60

B. -72

C. -84

D. -108

E. -124

12. If $7x+4y=18$ and $3x+y=-3$, what is the value of $x+y$?

F. 9

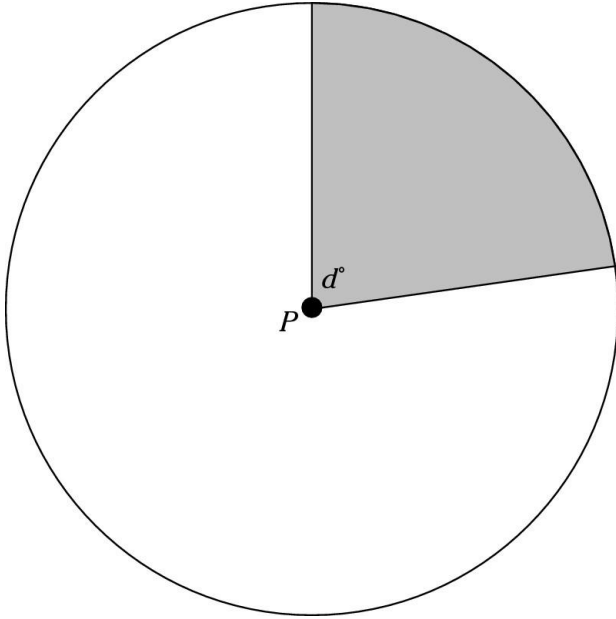
G. 11

H. 12

J. 14

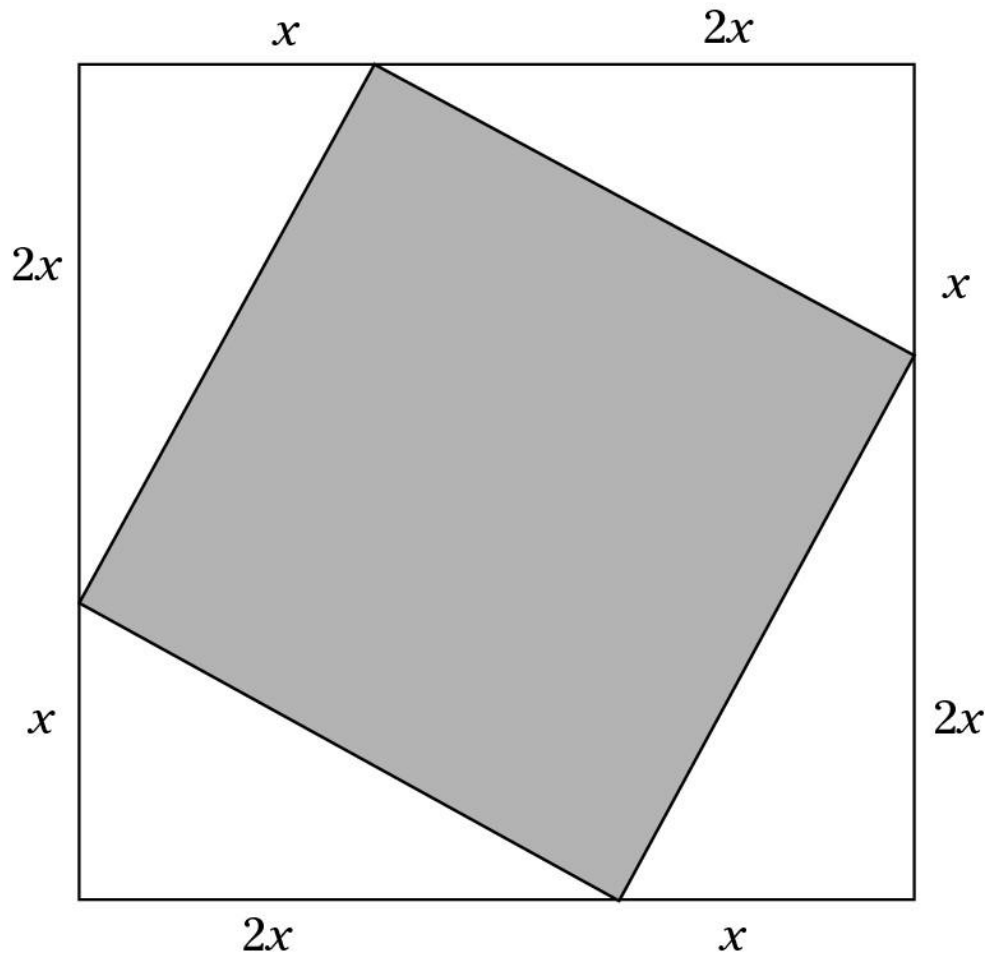
K. 15

13. In the following figure, the area of the shaded region is 20% of the area of the whole circle centered at P . The angle shown measures d degrees. What is its measurement in radians?



- A. $\frac{1}{5}\pi$
- B. $\frac{2}{5}\pi$
- C. $\frac{4}{5}\pi$
- D. $\frac{2}{15}\pi$
- E. $\frac{4}{15}\pi$

14. In the following figure, the area of the large square is 81. What is the area of the shaded square?



F. 45

G. $5\sqrt{3}$

H. $3\sqrt{5}$

J. $9\sqrt{5}$

K. $\sqrt{45}$

15. Let $f(x) = x^2 + 10x + 2$. If $g(x)$ is a transformation that moves $f(x)$ both one unit up and one unit to the right, then $g(x) =$

A. $x^2 + 8x - 6$

B. $x^2 + 9x + 3$

C. $x^2 + 10x - 6$

D. $x^2 + 11x + 3$

E. $x^2 + 12x + 6$

SET 2

1. If $\frac{a+b}{10} = \frac{a-0.1b^2}{a-b}$, what is the value of a ?

F. 0.01

G. 0.1

H. 1

J. 10

K. 100

2. A password for a computer system requires exactly 6 characters. Each character can be either one of the 26 letters from A to Z or one of the ten digits from 0 to 9. The first character must be a letter and the last character must be a digit. How many different possible passwords are there?

A. less than 10^7

B. between 10^7 and 10^8

C. between 10^8 and 10^9

D. between 10^9 and 10^{10}

E. more than 10^{10}

3. On the xy -plane, what is the area of a circle with this equation: $(x+3)^2 + (y-4)^2 = 49$?

F. 5π

G. 7π

H. 25π

J. 49π

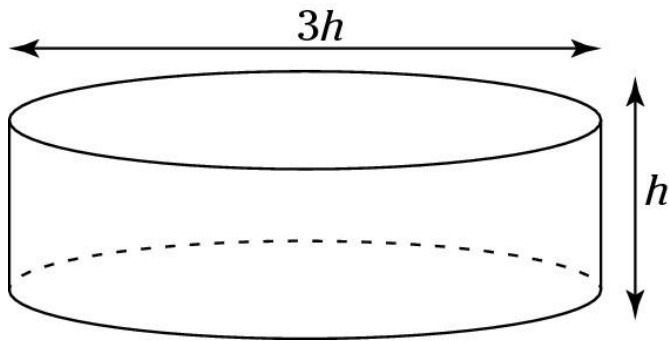
K. 125π

4. Which of the following is equal to $\sin x \sec x$?

A. $\tan x$

- B. $\cot x$
- C. $\cos x \tan x$
- D. $\cos x \csc x$
- E. $\cot x \csc x$

5. The following figure shows a cylindrical tank whose diameter is 3 times the length of its height. The tank holds approximately 231.5 cubic meters of fluid. Which of the following answer choices most closely approximates the height of the tank?

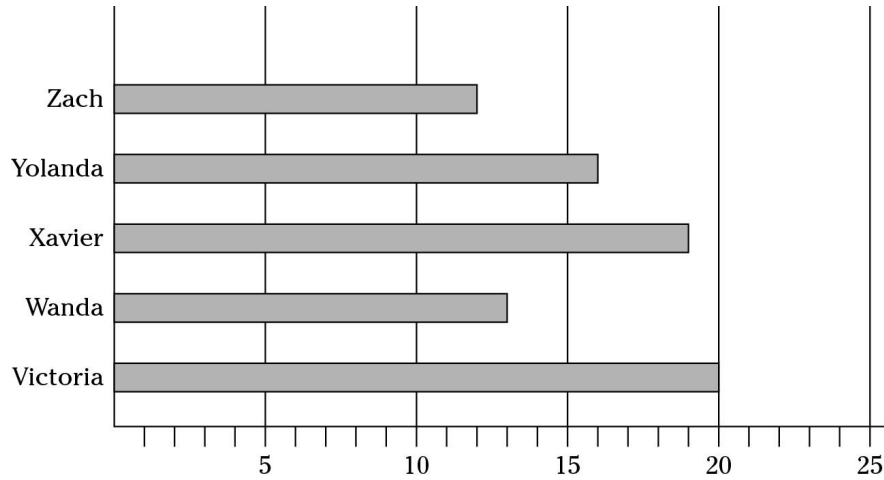


- F. 2 meters
- G. 3 meters
- H. 4 meters
- J. 5 meters
- K. 6 meters

6. Paulette, Quentin, and Rosie each donated money to a charity. Paulette gave as much money as Quentin and Rosie gave together. If Quentin had given three times more than he gave, he would have given \$40 more than Paulette. And if Rosie had given \$20 less, she would have given half as much as Paulette. How much did Paulette give?

- A. \$80
- B. \$120
- C. \$160
- D. \$200
- E. \$240

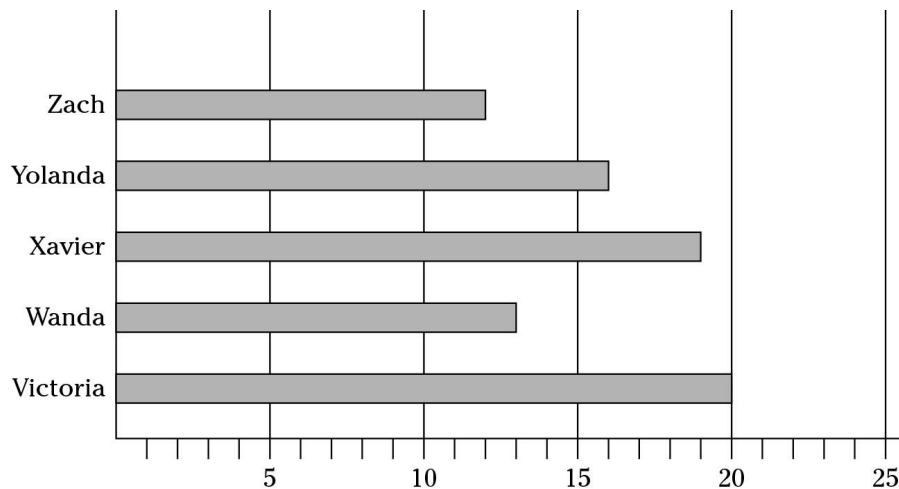
7. To this questions below, use the following graph, which provides information about the number of new clients five salespeople registered last month.



What percentage of the new clients did Yolanda register?

- F. 18%
- G. 20%
- H. 22%
- J. 24%
- K. 25%

8. To this questions below, use the following graph, which provides information about the number of new clients five salespeople registered last month.

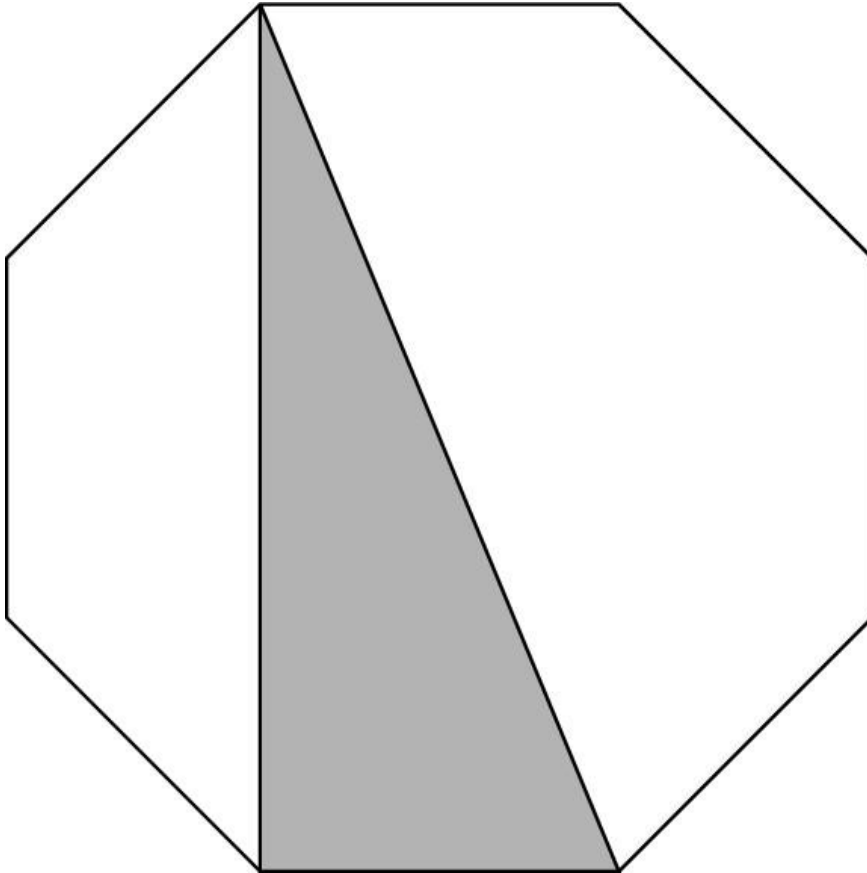


Suppose that next month Victoria registers twice as many clients as she did this month and that each of the other four salespeople registers the same number of clients as he or she did this month. In this case, what percentage of clients will Victoria have registered?

- A. 36%

- B. 40%
- C. 44%
- D. 48%
- E. 50%

9. In the following figure, the regular octagon has a side with a length of 1. What is the area of the shaded region?



- F. $\sqrt{2} + 1$
- G. $\sqrt{2} + 2$
- H. $\frac{\sqrt{2} + 1}{2}$
- J. $\frac{\sqrt{2}}{2} + 1$
- K. $\frac{\sqrt{2}}{2} + 2$

10. If $\frac{a}{c} - \frac{a}{b} = \frac{b-c}{a}$, with $a > 0$, $b > 0$, and $c > 0$, what is the value of a in terms of b and c ?

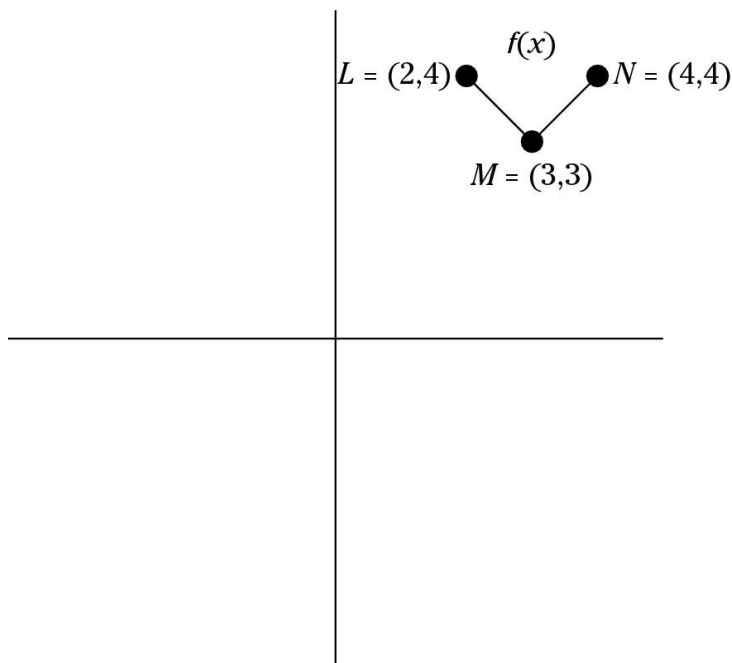
- A. $b - c$

- B. \sqrt{bc}
- C. $\sqrt{b-c}$
- D. $\frac{\sqrt{b-c}}{bc}$
- E. $\frac{\sqrt{bc}}{b-c}$

11. At 10:00, Angela starts from her home and runs at a constant pace to Kathleen's house, which is exactly 2 miles away. Immediately, she and Kathleen turn around and walk back to Angela's house exactly 4 miles an hour slower than Angela ran. When they arrive at Angela's house, the time is 10:45. At what speed did Angela run?

- F. 6 miles per hour
- G. 6.5 miles per hour
- H. 7 miles per hour
- J. 7.5 miles per hour
- K. 8 miles per hour

12. The following figure shows $f(x)$, which includes points $L, M,$ and N plus the line segments \overline{LM} and \overline{MN} . Which of the following functions is equivalent to $f(x)$?



- A. $f(x+ 6)$
- B. $f(x- 6)$
- C. $f(6 - x)$

D. $-f(x+ 6)$

E. $-f(x- 6)$

13. If $\log_9 n = \frac{1}{2}$ and $n > 0$, what is the value of \sqrt{n} ?

F. 3

G. $\sqrt{3}$

H. $\sqrt[3]{3}$

J. $\sqrt[3]{8}$

K. $\sqrt[3]{9}$

14. In the complex numbers, where $i = \sqrt{-1}$, the conjugate of any value $a + bi$ is $a - bi$. What is the result when you multiply $2 + 7i$ by its conjugate?

A. 45

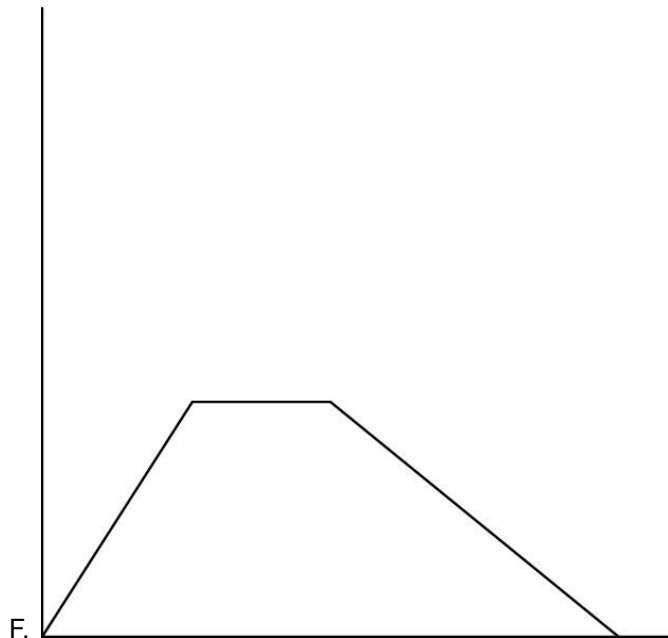
B. -45

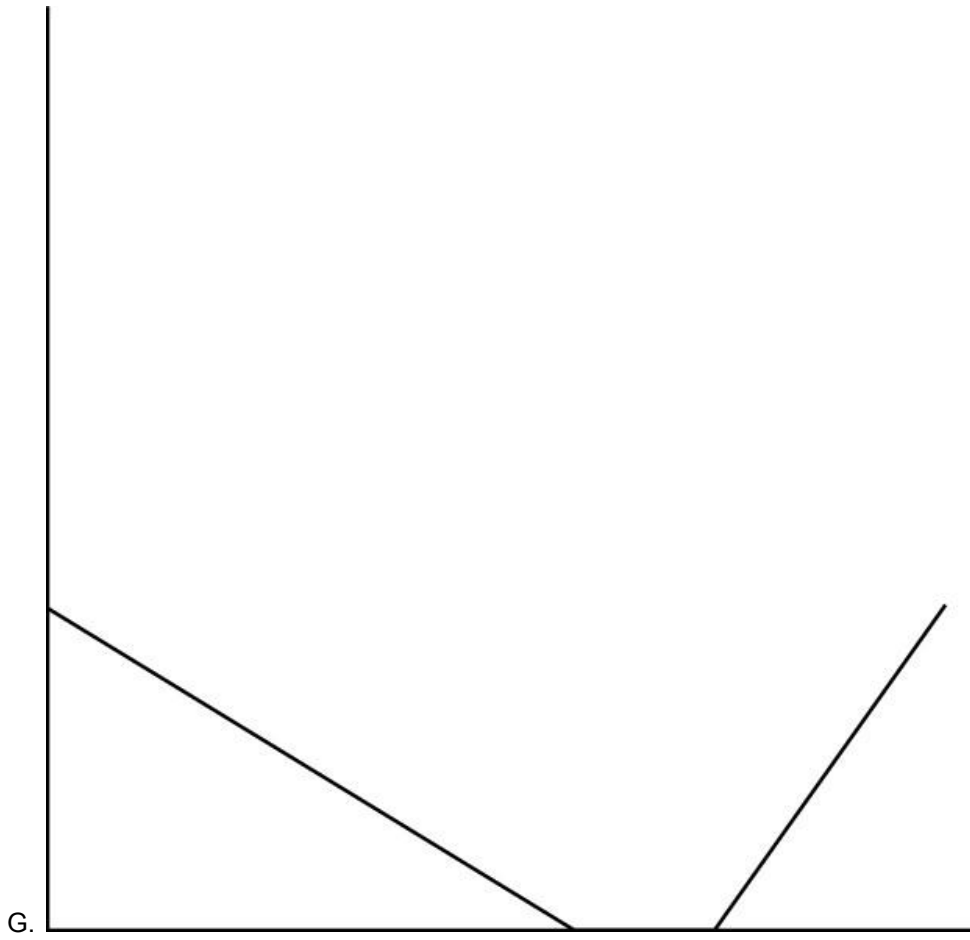
C. $45i$

D. 53

E. $53i$

15. Jacob works as a lifeguard at a local pool. At the beginning of a 12-hour overnight shift, the pool was full, and Jacob began draining it. After 2 hours, the pool was completely empty. He spent 3 hours cleaning the pool and then began filling it up again. The pool finished filling just as his shift ended. Which of the following graphs accurately describes the amount of water in the pool throughout Jacob's shift?





G.

