



## MATH

## Question 1 of 18



SAT

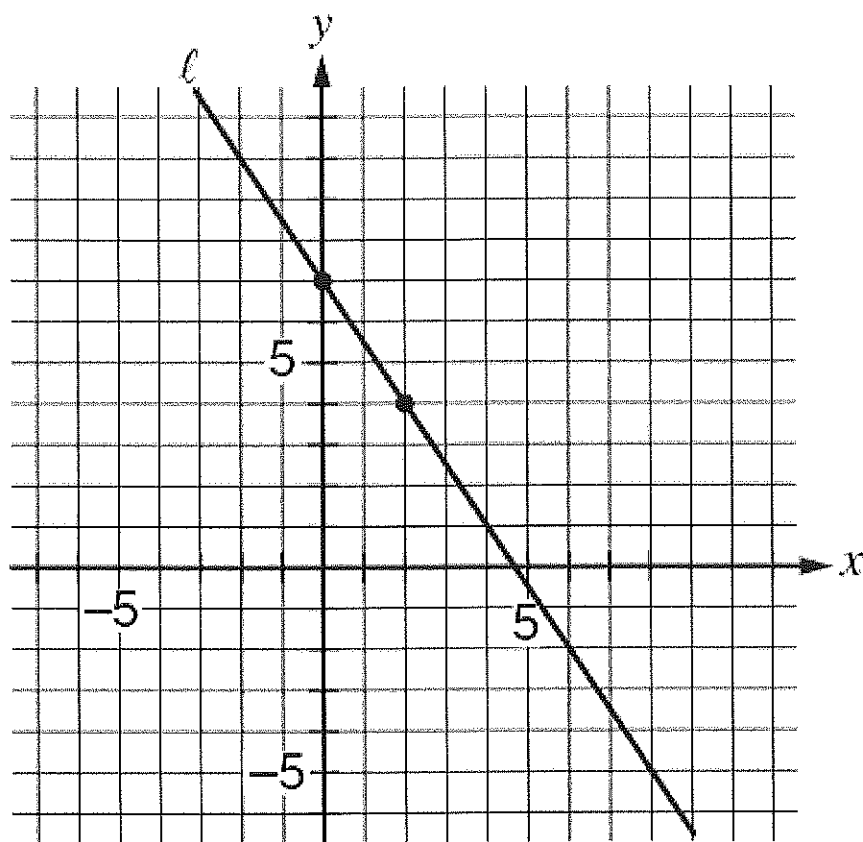
PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

Heart of Algebra

Line  $l$  is graphed in the  $xy$ -plane below.



If line  $l$  is translated up 5 units and right 7 units, then what is the slope of the new line?

Select an Answer

(A)  $-\frac{2}{5}$

(B)  $-\frac{3}{2}$

(C)  $-\frac{8}{9}$

(D)  $-\frac{11}{14}$

**View Correct Answer**



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Math

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## MATH

### Question 2 of 18



SAT

PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

Heart of Algebra

The mean number of students per classroom,  $y$ , at Central High School can be estimated using the equation  $y = 0.8636x + 27.227$ , where  $x$  represents the number of years since 2004 and  $x \leq 10$ . Which of the following statements is the best interpretation of the number 0.8636 in the context of this problem?

#### Select an Answer

- (A) The estimated mean number of students per classroom in 2004
- (B) The estimated mean number of students per classroom in 2014
- (C) The estimated yearly decrease in the mean number of students per classroom
- (D) The estimated yearly increase in the mean number of students per classroom

[View Correct Answer](#)



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MATH

## Question 3 of 18



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PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

Passport to Advanced Math

If  $\sigma^2 + 14\sigma = 51$  and  $\sigma > 0$ , what is the value of  $\sigma + 7$ ?

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**View Correct Answer**



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## MATH

### Question 4 of 18

 SAT: Calculator: Not Permitted Passport to Advanced Math

If  $\frac{2}{\sigma-1} = \frac{4}{y}$  where  $y \neq 0$  and  $\sigma \neq 1$ , what is  $y$  in terms of  $\sigma$ ?

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Select an Answer

(A)  $y = 2\sigma - 2$

(B)  $y = 2\sigma - 4$

(C)  $y = 2\sigma - \frac{1}{2}$

(D)  $y = \frac{1}{2}\sigma + 1$

View Correct Answer 

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MATH

## Question 5 of 18

 SAT PSAT/NMSQT PSAT 10 Calculator: Not Permitted Passport to Advanced Math

If  $y = x^3 + 2x + 5$  and  $z = x^2 + 7x + 1$ , what is  $2y + z$  in terms of  $x$ ?

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Select an Answer

- (A)  $3x^3 + 11x + 11$
- (B)  $2x^3 + x^2 + 9x + 6$
- (C)  $2x^3 + x^2 + 11x + 11$
- (D)  $2x^3 + 2x^2 + 18x + 12$

View Correct Answer 

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## MATH

### Question 6 of 18



SAT

Calculator: Not Permitted

Passport to Advanced Math

If  $a^{-\frac{1}{2}} = x$ , where  $a > 0$  and  $x > 0$ , which of the following equations gives  $a$  in terms of  $x$ ?

Select an Answer

(A)  $a = \frac{1}{\sqrt{x}}$

(B)  $a = \frac{1}{x^2}$

(C)  $a = \sqrt{x}$

(D)  $a = -x^2$

View Correct Answer



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MATH

## Question 7 of 18



SAT

PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

Passport to Advanced Math

The graph of  $y = (2x - 4)(x - 4)$  is a parabola in the  $xy$ -plane. In which of the following equivalent equations do the  $x$ - and  $y$ -coordinates of the vertex of the parabola appear as constants or coefficients?

Select an Answer

(A)  $y = 2x^2 - 12x + 16$

(B)  $y = 2x(x - 6) + 16$

(C)  $y = 2(x - 3)^2 + (-2)$

(D)  $y = (x - 2)(2x - 8)$

View Correct Answer





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MATH

## Question 8 of 18

 SAT Calculator: Not Permitted No Subscore Additional Topics in Math

Which of the following is equal to  $(14 - 2i)(7 + 12i)$ ?

(Note:  $i = \sqrt{-1}$ )

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Select an Answer

(A) 74

(B) 122

(C)  $74 + 154i$

(D)  $122 + 154i$

View Correct Answer 

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## Question 9 of 18



SAT

PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

Heart of Algebra

$$\frac{5(k+2)-7}{6} = \frac{13-(4-k)}{9}$$

In the equation above, what is the value of  $k$ ?

Select an Answer

(A)  $\frac{9}{17}$

(B)  $\frac{9}{13}$

(C)  $\frac{33}{17}$

(D)  $\frac{33}{13}$

View Correct Answer




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## MATH

### Question 10 of 18

 SAT PSAT/NMSQT PSAT 10 Calculator: Not Permitted Heart of Algebra

$$4x - y = 3y + 7$$

$$x + 8y = 4$$

Based on the system of equations above, what is the value of the product  $xy$ ?

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Select an Answer


(A)  $-\frac{3}{2}$

(B)  $\frac{1}{4}$

(C)  $\frac{1}{2}$

(D)  $\frac{11}{9}$

View Correct Answer 

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## Question 11 of 18



SAT

PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

Heart of Algebra

If  $\frac{1}{2}x + \frac{1}{3}y = 4$ , what is the value of  $3x + 2y$ ?

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**View Correct Answer**



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## MATH

### Question 12 of 18

 SAT Calculator: Not Permitted No Subscore Additional Topics in Math

Which of the following is equal to  $\sin\left(\frac{\pi}{5}\right)$ ?

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Select an Answer

(A)  $-\cos\left(\frac{\pi}{5}\right)$

(B)  $-\sin\left(\frac{\pi}{5}\right)$

(C)  $\cos\left(\frac{3\pi}{10}\right)$

(D)  $\sin\left(\frac{7\pi}{10}\right)$

View Correct Answer 

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MATH

## Question 13 of 18



SAT

PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

Heart of Algebra

$$\frac{1}{2}x - \frac{1}{4}y = 5$$

$$ax - 3y = 20$$

In the system of linear equations above,  $a$  is a constant. If the system has no solution, what is the value of  $a$ ?

Select an Answer

(A)  $\frac{1}{2}$

(B) 2

(C) 6

(D) 12

View Correct Answer



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## MATH

### Question 14 of 18



SAT

Calculator: Not Permitted

Passport to Advanced Math

$$\frac{1}{x} + \frac{2}{x} = \frac{1}{5}$$

Anise needs to complete a printing job using both of the printers in her office. One of the printers is twice as fast as the other, and together the printers can complete the job in 5 hours. The equation above represents the situation described. Which of the following describes what the expression  $\frac{1}{x}$  represents in this equation?

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#### Select an Answer

- (A) The time, in hours, that it takes the slower printer to complete the printing job alone
- (B) The portion of the job that the slower printer would complete in one hour
- (C) The portion of the job that the faster printer would complete in two hours
- (D) The time, in hours, that it takes the slower printer to complete  $\frac{1}{5}$  of the printing job

**View Correct Answer**



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## MATH

### Question 15 of 18

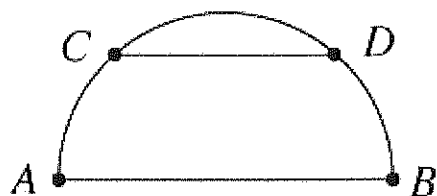


SAT

Calculator: Not Permitted

No Subscore

Additional Topics in Math



The semicircle above has a radius of  $r$  inches, and chord  $\overline{CD}$  is parallel to the diameter  $\overline{AB}$ . If the length of  $\overline{CD}$  is  $\frac{2}{3}$  of the length of  $\overline{AB}$ , what is the distance between the chord and the diameter in terms of  $r$ ?

#### Select an Answer


(A)  $\frac{1}{3}\pi r$

(B)  $\frac{2}{3}\pi r$

(C)  $\frac{\sqrt{2}}{2}r$

(D)  $\frac{\sqrt{5}}{3}r$



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Math

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## MATH

### Question 16 of 18

 SAT Calculator: Not Permitted No Subscore Additional Topics in Math

It is given that  $\sin x = a$ , where  $x$  is the radian measure of an angle and  $\frac{\pi}{2} < x < \pi$ .

If  $\sin w = -a$ , which of the following could be the value of  $w$ ?

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#### Select an Answer

(A)  $\pi - x$

(B)  $x - \pi$

(C)  $2\pi + x$

(D)  $x - 2\pi$

**View Correct Answer** 

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MATH

## Question 17 of 18



SAT

PSAT/NMSQT

PSAT 10

Calculator: Not Permitted

No Subscore

Additional Topics in Math

$$x^2 + y^2 - 6x + 8y = 144$$

The equation of a circle in the  $xy$ -plane is shown above. What is the diameter of the circle?

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**View Correct Answer**





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Question 18 of 18



SAT Calculator: Not Permitted Passport to Advanced Math

What is one possible solution to the equation  $\frac{24}{x+1} - \frac{12}{x-1} = 1$ ?

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View Correct Answer

