

# SAT Linear Equations in Two Variables Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Circle one answer for each question. Use the blank space for calculations. A calculator is allowed.

**1. What is the  $y$ -intercept of the graph of  $4x + 5y = 40$  in the  $xy$ -plane?**

- A. (0, 4)
- B. (0, 5)
- C. (0, 8)
- D. (0, 10)

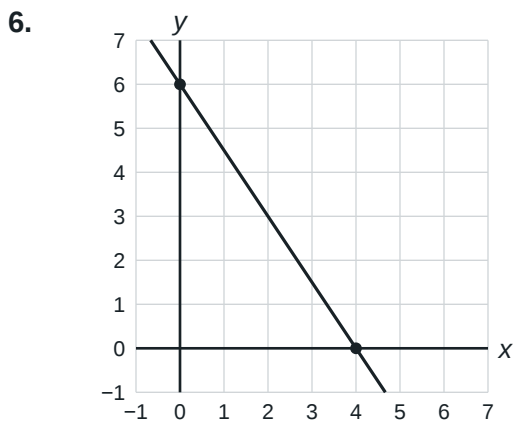
**2. Which point lies on the graph of  $2x - 3y = 12$  in the  $xy$ -plane?**

- A. (0, 4)
- B. (3, 2)
- C. (4, 6)
- D. (6, 0)

**3. A store sells notebooks for \$3 each and folders for \$2 each. Maya spends exactly \$24 on  $n$  notebooks and  $f$  folders. Which equation represents this situation?**

- A.  $2n + 3f = 24$
- B.  $n + f = 24$
- C.  $5(n + f) = 24$
- D.  $3n + 2f = 24$

4. Jaya earned \$600 last month from  $t$  hours of tutoring at \$15 per hour and  $b$  hours at a bookstore at \$10 per hour, so  $15t + 10b = 600$ . If she tutored for 20 hours, how many hours did she work at the bookstore?
- A. 20  
B. 30  
C. 40  
D. 60
5. What is the slope of the graph of  $6x + 2y = 7$  in the  $xy$ -plane?
- A.  $-3$   
B.  $-\frac{1}{3}$   
C. 3  
D. 6



Which equation represents the line shown in the  $xy$ -plane?

- A.  $3x + 2y = 12$   
B.  $2x + 3y = 12$   
C.  $2x + 3y = 18$   
D.  $3x - 2y = 12$

7. A theater models its ticket sales for one show with  $20x + 50y = 1,000$ , where  $x$  is the number of \$20 tickets sold and  $y$  is the number of \$50 tickets sold. What is the best interpretation of the  $x$ -intercept of the graph of this equation in the  $xy$ -plane?
- A. The theater's total ticket sales were \$50.
  - B. If no \$20 tickets were sold, 20 of the \$50 tickets were sold.
  - C. If no \$50 tickets were sold, 50 of the \$20 tickets were sold.
  - D. The theater could sell at most 50 of the \$50 tickets.
8. In the  $xy$ -plane, the graph of  $cx + 3y = 12$  passes through the point  $(2, 6)$ , where  $c$  is a constant. What is the value of  $c$ ?
- A.  $-3$
  - B.  $1$
  - C.  $3$
  - D.  $15$

9.

| $x$ | $y$  |
|-----|------|
| 0   | 7    |
| 2   | 3    |
| 5   | $-3$ |

The table shows three points on a line in the  $xy$ -plane. Which equation represents the line?

- A.  $x + 2y = 7$
- B.  $2x - y = 7$
- C.  $-2x + y = 7$
- D.  $2x + y = 7$

10. Line  $k$  is perpendicular to the graph of  $2x - 5y = 10$  in the  $xy$ -plane and passes through  $(0, 4)$ . Which equation represents line  $k$ ?
- A.  $y = 0.4x + 4$
  - B.  $y = -2.5x + 4$
  - C.  $y = 2.5x + 4$
  - D.  $y = -0.4x + 4$
11. In the  $xy$ -plane, the graph of  $3x + ky = 24$ , where  $k$  is a positive constant, has  $x$ -intercept  $(r, 0)$  and  $y$ -intercept  $(0, s)$ . If  $r = 2s$ , what is the value of  $k$ ?
- A. 1.5
  - B. 3
  - C. 6
  - D. 12
12. A line in the  $xy$ -plane has  $x$ -intercept  $(c, 0)$  and  $y$ -intercept  $(0, d)$ , where  $c$  and  $d$  are positive. What is the slope of the line?
- A.  $-\frac{c}{d}$
  - B.  $-\frac{d}{c}$
  - C.  $\frac{c}{d}$
  - D.  $\frac{d}{c}$

# Answer key

1 **C** · 2 **D** · 3 **D** · 4 **B** · 5 **A** · 6 **A** · 7 **C** · 8 **A** · 9 **D** · 10 **B** · 11 **C** · 12 **B**

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**1. C: (0, 8)**

The y-intercept is where  $x = 0$ . Then  $5y = 40$ , so  $y = 8$ . The point (10, 0) is the x-intercept.

**2. D: (6, 0)**

Substitute each point. For (6, 0),  $2(6) - 3(0) = 12$ . The point (0, 4) gives  $-12$  because the y-term is subtracted; the y-intercept is (0,  $-4$ ).

**3. D:  $3n + 2f = 24$**

The notebooks cost  $3n$  dollars and the folders cost  $2f$  dollars. Together they cost 24 dollars, so  $3n + 2f = 24$ . Choice A attaches each price to the wrong item.

**4. B: 30**

Substitute  $t = 20$ :  $300 + 10b = 600$ , so  $10b = 300$  and  $b = 30$ . Choice D, 60, is the number of bookstore hours if she had not tutored at all.

**5. A:  $-3$**

Solve for y:  $2y = -6x + 7$ , so  $y = -3x + \frac{7}{2}$ . The slope is the coefficient of x, which is  $-3$ .

**6. A:  $3x + 2y = 12$**

The line passes through (0, 6) and (4, 0). Both points satisfy  $3x + 2y = 12$ :  $3(0) + 2(6) = 12$  and  $3(4) + 2(0) = 12$ . Choice B has the intercepts reversed.

**7. C: If no \$50 tickets were sold, 50 of the \$20 tickets were sold.**

At the  $x$ -intercept,  $y = 0$ , so  $20x = 1,000$  and  $x = 50$ . That means 50 of the \$20 tickets and none of the \$50 tickets. Choice B describes the  $y$ -intercept,  $(0, 20)$ .

**8. A:  $-3$**

Substitute  $x = 2$  and  $y = 6$ :  $2c + 18 = 12$ . Then  $2c = -6$ , so  $c = -3$ . Choice B comes from swapping the coordinates.

**9. D:  $2x + y = 7$**

When  $x$  increases by 2,  $y$  decreases by 4, so the slope is  $-2$  and the line is  $y = -2x + 7$ . Adding  $2x$  to both sides gives  $2x + y = 7$ . Choice C passes through  $(0, 7)$  but has slope 2.

**10. B:  $y = -2.5x + 4$**

Solving  $2x - 5y = 10$  for  $y$  gives  $y = 0.4x - 2$ , so its slope is 0.4. A perpendicular line has slope  $-\frac{1}{0.4} = -2.5$ . With  $y$ -intercept 4, line  $k$  is  $y = -2.5x + 4$ .

**11. C: 6**

Setting  $y = 0$  gives  $3r = 24$ , so  $r = 8$ . Since  $r = 2s$ ,  $s = 4$ . Setting  $x = 0$  gives  $4k = 24$ , so  $k = 6$ . Choice A comes from making  $s$  twice  $r$  instead.

**12. B:  $-\frac{d}{c}$**

From  $(c, 0)$  to  $(0, d)$ ,  $y$  changes by  $d$  and  $x$  changes by  $-c$ . The slope is  $\frac{d}{-c} = -\frac{d}{c}$ . With both intercepts positive, the line falls from left to right.