ALBERT

Name _____ Date _____

# Graphs as Solution Sets Worksheet

Algebra 1 · Common Core HSA-REI.D.10

> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

## Practice

Builds the skill step by step.

1. Is the point (2, 7) on the graph of $y = 3x + 1$?

   A. Yes, because 7 is greater than 2.

   B. Yes, because $3(2) + 1 = 7$.

   C. No, because $2 + 1 = 3$.

   D. No, because $3(2) + 1 = 6$.

2. Is the point (4, 10) on the graph of $y = 2x + 3$?

   A. No, because $2(4) + 3 = 11$, not 10.

   B. Yes, because $2(4) + 3 = 10$.

   C. Yes, because $4 + 3 = 7$.

   D. No, because 10 is not a multiple of 4.

3. The point (3, y) is on the graph of $y = 4x - 5$. What is y?

4. The point (x, 9) is on the graph of $y = 2x + 1$. What is x?

5. What does each point on the graph of $y = x + 5$ represent?

   A. A point where x and y are equal

   B. A value of x that makes $y = 0$

   C. A pair (x, y) that makes $y = x + 5$ true

   D. The slope of the line

6. The point $(-2, y)$ is on the graph of $y = x^2$. What is y?

7. The point $(k, 0)$ is on the graph of $3x + 2y = 12$. What is k?

8. Which point is on the graph of $2x + y = 8$?

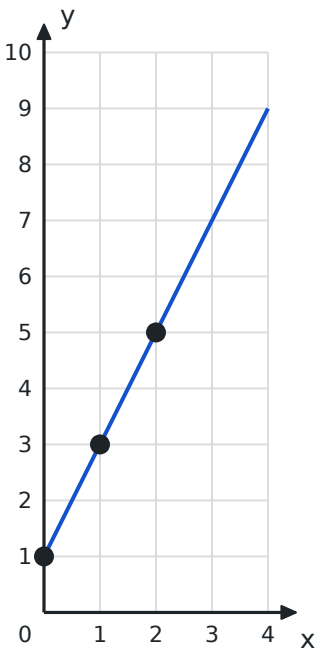
   A. (4, 1)

   B. (1, 5)

   C. (2, 3)

   D. (3, 2)

9. The graph shows a line. If the line keeps going, what is y when x = 3?




10. The point (1, 2) is not on the graph of $y = x^2 + 2$. What does that tell you?

A. The graph is not a curve.

B. x = 1, y = 2 is not a solution of the equation.

C. x = 1 is not allowed in the equation.

D. The equation has no solutions.

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## On Level

Grade-level practice.

1. The point (a, 5) is on the graph of $x^2 + y = 21$, and a is positive. What is a?

2. Which point lies on the graph of $y = -x^2 + 4$?

   A. $(-1, 5)$

   B. $(3, 1)$

   C. $(2, 4)$

   D. $(1, 3)$

3. Where does the graph of $4x - 3y = 12$ cross the y-axis?

4. Where does the graph of $y = x^2 - 9$ cross the x-axis? List the points from left to right.

5. A graph passes through (2, 8) and (3, 27). Which equation could it be the graph of?

   A. $y = x^3$

   B. $y = 4x$

   C. $y = x^2 + 4$

   D. $y = 2x + 4$

6. The graph of $y = x^2 + c$ passes through (3, 5). What is c?

7. x and y must be whole numbers 0 or greater with $x + y = 6$. How many points are on the graph?

   A. 7

   B. 6

   C. 5

   D. Infinitely many

8. The point $(-1, y)$ is on the graph of $y = 3x - 2$. What is y?

9. The point $(2, b)$ is on the graph of $y = 3(2)^x$. What is b?

10. The points (1, 4), (2, 7) and (3, 10) are all on the graph of which equation?

    A. $y = 4x$

    B. $y = x + 3$

    C. $y = 2x + 2$

    D. $y = 3x + 1$

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## Challenge

Multi-step and word problems that stretch it.

1. The point (2, 3) is on the graph of $ax + 2y = 14$. What is a?

2. The points (1, 6) and (2, 9) are on the graph of $y = ax + b$. Find a and b.

3. The point (p, q) is on the graph of $y = f(x)$. Which statement must be true?

   A. $p = f(q)$

   B. $q = f(p)$

   C. $f(p) = 0$

   D. $p = q$

4. The point (k, k) is on the graph of $y = 3x - 8$. What is k?

5. The graph of $y = x^2 - 2x$ passes through (k, 3), and k is positive. What is k?

6. Why is the graph of $y = 2x + 1$ a whole line and not just a few points?

   A. Because lines are easier to draw.

   B. Because the equation has exactly two solutions.

   C. Every real number x gives a solution, so the solutions fill in a line.

   D. Because only whole numbers are solutions.

7. The points $(-1, 4)$ and $(3, 4)$ are on the graph of $y = x^2 + bx + c$. Find b and c.

8. Which equation's graph contains all three points $(0, 0)$, $(1, 1)$ and $(-1, 1)$?

   A. $y = x^2$

   B. $y = x$

   C. $y = x^3$

   D. $y = 2x - 1$

9. How many points with integer coordinates are on the graph of $x^2 + y^2 = 25$?

10. $(3, 2)$ is a solution of both $2x - y = 4$ and $x + y = 5$. What does that mean for their graphs?

    A. The lines are parallel.

    B. The two lines cross at $(3, 2)$.

    C. Both lines pass through the origin.

    D. The lines are the same.