Equations of Parallel Lines Practice
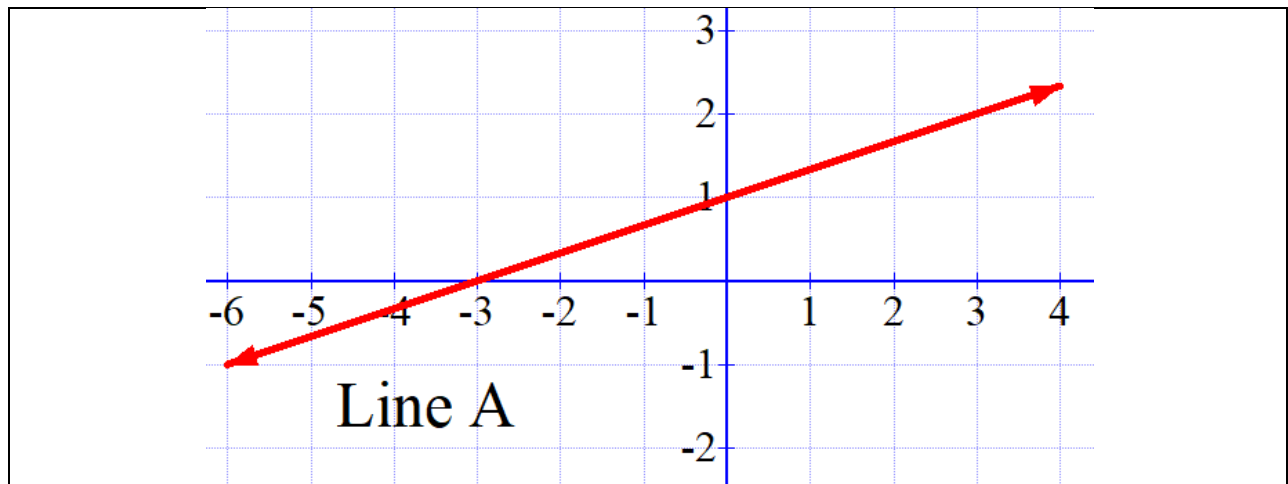
1. Determine the equation of the line parallel to y = 10x – 1 and passing through the point (2,7).

   A) y = 10x – 13   B) y = 10x – 7   C) y = -10x – 13   D) y = -10x – 7

2. Determine the equation of the line parallel to 4x – 3y = 12 and passing through the point (-1, 4).

   A) y = 4x + 16   B) y = 4x – 4   C) $y = \left(\dfrac{4}{3}\right)x + 16$ D) $y = \left(\dfrac{4}{3}\right)x + \dfrac{16}{3}$

Use the graph below to answer the next question.

Line A

3. The equation of a line parallel to Line A and having a y-intercept of -4 is

   A) y = 3x – 4
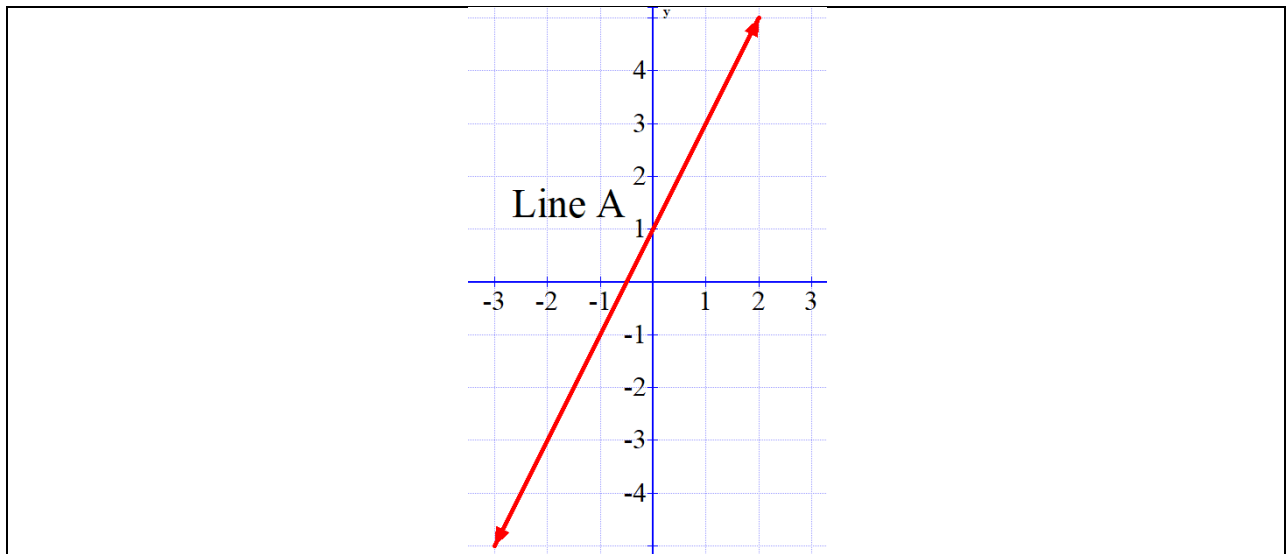
   B) $y = \left(\dfrac{1}{3}\right)x - 4$

   C) $y = \left(\dfrac{1}{3}\right)x + 4$

   D) y = -3x – 4

4. The points (-2, y) and (-1, 1) lie on the line parallel to the line $2y - 8 = -8x$.
   The value of y is _____.

5. Determine the equation of the line parallel to $-12x = 2y - 9$ and having the
   same x-intercept as $y = x - 7$.

Use the graph below to answer the next question.

6. The equation of a line that could be parallel to Line A above is
   A) $y = -2x + 1$ B) $10y = 2x - 4$ C) $8 + 2x - y = 0$ D) $y = (1/2)x$

Equations of Parallel Lines PracticeSolutions

1. Determine the equation of the line parallel to y = 10x – 1 and passing through the point (2,7).

   A) y = 10x – 13   B) y = 10x – 7   C) y = -10x – 13   D) y = -10x – 7

Solution

The slope of y = 10x – 1 is 10. Since parallel lines have the same slope, use this slope and the given point (2,7) to determine the equation of the line.

$$slope = \frac{rise}{run}$$

$$10 = \frac{y-7}{x-2}$$

10(x – 2) = y – 7

10x – 20 = y – 7

Add 7 to both sides.

10x – 13 = y

The correct answer is A.

2. Determine the equation of the line parallel to 4x – 3y = 12 and passing through the point (-1, 4).

   A) y = 4x + 16   B) y = 4x – 4   C) $y = \left(\frac{4}{3}\right)x + 16$ D) $y = \left(\frac{4}{3}\right)x + \frac{16}{3}$

Solution

Isolate y to determine the slope of 4x – 3y = 12.

Subtract 4x from both sides.

-3y = -4x + 12

Divide every term by -3.

$$y = \left(\frac{4}{3}\right)x - 4$$

The slope of 4x – 3y = 12 is $\left(\frac{4}{3}\right)$.

Since parallel lines have the same slope, use this slope and the given point (-1,4) to determine the equation of the line.

$$slope = \frac{rise}{run}$$

$$\frac{4}{3} = \frac{y-4}{x-(-1)}$$

Cross multiply.

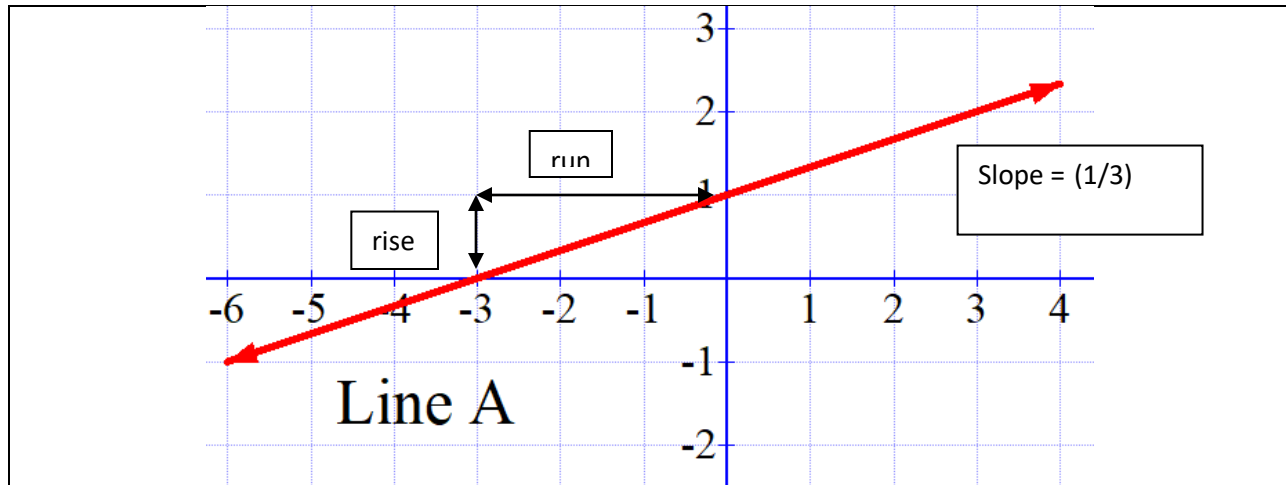4(x + 1) = 3(y – 4)

4x + 4 = 3y – 12

Add 12 to both sides.

4x + 16 = 3y

Divide every term by 3.

$$y = \left(\frac{4}{3}\right)x + \frac{16}{3}$$

The correct answer is D.

Use the graph below to answer the next question.

3. The equation of a line parallel to Line A and having a y-intercept of -4 is

A) y = 3x – 4

B) $y = \left(\dfrac{1}{3}\right)x - 4$ **Answer**

C) $y = \left(\dfrac{1}{3}\right)x + 4$

D) y = -3x – 4

Solution

The slope of Line A is $\left(\dfrac{1}{3}\right)$. Since the y-intercept is -4, the correct answer is B.

4. The points (-2, y) and (-1, 1) lie on the line parallel to the line 2y – 8 = -8x.
   The value of y is _5_.

Solution

First find the slope of the line 2y – 8 = 8x, by isolating y.

Add 8 to both sides and then divide every term by 2.

y = -4x + 4

Since parallel lines have the same slope, use a slope of -4, and the points (-2, y) and (-1,1) to find the value of y.

$$slope = \frac{rise}{run}$$

$$-4 = \frac{y-1}{-2-(-1)}$$

$$-4 = \frac{y-1}{-1}$$

4 = y – 1

y = 5

The value of y is __5__.

5. Determine the equation of the line parallel to -12x = 2y – 9 and having the same x-intercept as y = x – 7.

Solution

To find the x-intercept of y = x – 7, set y = 0 and solve for x.

(0)=x – 7

x = 7

Since the x-intercept is 7, we will use the point (7,0) when finding the equation.

Isolate y in the equation -12x = 2y – 9.

Add 9 to both sides and then divide every term by 2.

$$y = -6x + \frac{9}{2}$$

Since the slopes of parallel lines are equal, we will use a slope of -6 when finding the equation.
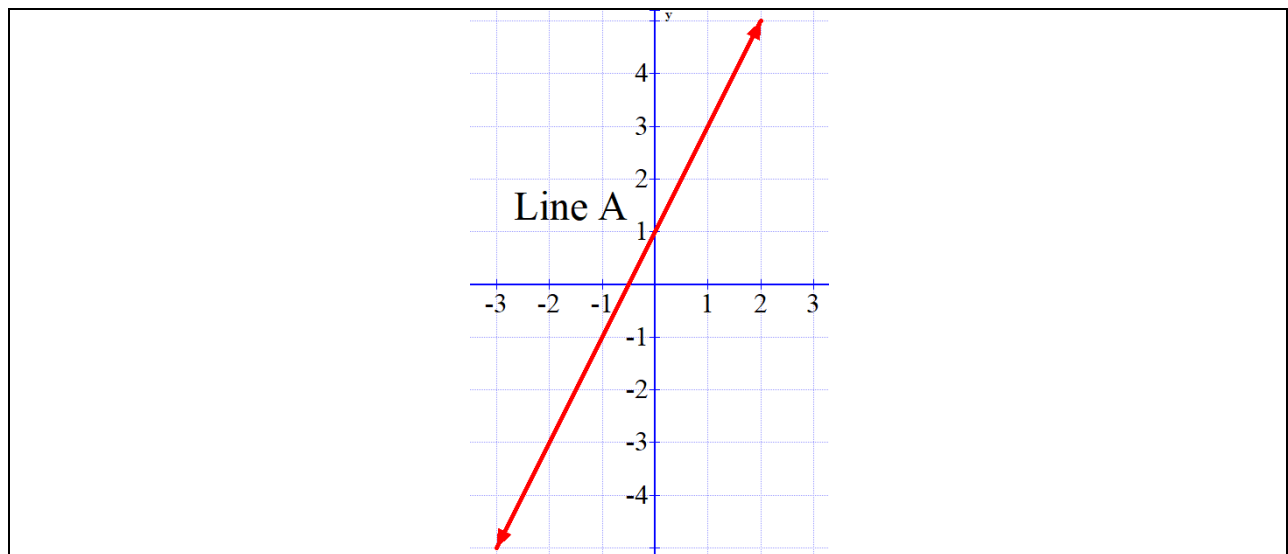
$$slope = \frac{rise}{run}$$

$$-6 = \frac{y-0}{x-7}$$

-6(x – 7) = y

-6x + 42 = y

The equation of the line parallel to -12x = 2y – 9 and having the same x-intercept as y = x – 7 is y = -6x + 42.

Use the graph below to answer the next question.

Line A

6. The equation of a line that could be parallel to Line A above is

A) y = -2x + 1   B) 10y = 2x – 4   C) 8 + 2x – y = 0   D) y = (1/2)x

Solution

The equation of Line A can be determined by selecting any 2 points on the graph and dividing the rise by the run. Two convenient points would be (0,1) and (1,3). The slope is 2.

The only equation from the given choices having a slope of 2 is C.

The correct answer is C.