

3.16

Writing the Equation of a Line through a Given Point and Parallel to a Given Line

• Example 1

Write the equation of the line parallel to the line $2x - 3y = 6$ that passes through $(-3, -7)$.

Two parallel lines are either two vertical lines or two lines having the same slope.

We first find the slope of the line of $2x - 3y = 6$ by solving for y .

$$\begin{aligned}2x - 3y &= 6 \\ -3y &= 6 - 2x \\ y &= \frac{2}{3}x - 2\end{aligned}$$

Thus, the slope of any line parallel to this line must also be $\frac{2}{3}$. In other words, the line that we are looking for has equation

$$y = \frac{2}{3}x + b$$

for some number b . That line must contain the point $(-3, -7)$.

Thus we must have

$$-7 = \frac{2}{3}(-3) + b.$$

Solving for b , we obtain

$$b = -5$$

Thus the equation of the line is

$$y = \frac{2}{3}x - 5$$

• • • CHECK YOURSELF 1

Write the equation of the line parallel to the line $x - 4y = 2$ that passes through $(8, 7)$.

• • • CHECK YOURSELF ANSWER

1. $y = \frac{1}{4}x + 5.$

3.16 Exercises

Name _____

Section _____

Date _____

A N S W E R S

1. _____

2. _____

3. _____

4. _____

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9. _____

10. _____

Write the equation of the line parallel to the given line that passes through the given point.

1. $6x - 3y = 7; (-1, -1)$

2. $8x + 4y = 9; (-2, 4)$

3. $3x + 4y = 7; (1, 2)$

4. $-12x + 4y = 5; (1, 10)$

5. $8x + y = 19; (2, 11)$

6. $4x + y = -3; (-2, 4)$

7. $-x - 2y = 5; (5, 9)$

8. $5x - 5y = 1; (7, -2)$

9. $x + y = 10; (0, 9)$

10. $2x + 6y = 8; (6, 6)$