

## Study Guide

**Equations as Relations**

An equation in two variables describes a relation. It is often easier to determine the solution of such an equation by solving for one of the variables.

**Example:** Solve  $3y + 2x = 10$  if the domain is  $\{-7, -1, 8\}$ .

First solve for  $y$  in terms of  $x$ .

$$\begin{aligned} 3y + 2x &= 10 \\ 3y &= 10 - 2x \\ y &= \frac{10 - 2x}{3} \end{aligned}$$

Then substitute values of  $x$ .

$x$	$\frac{10 - 2x}{3}$	$y$	$(x, y)$
-7	$\frac{10 - 2(-7)}{3}$	8	$(-7, 8)$
-1	$\frac{10 - 2(-1)}{3}$	4	$(-1, 4)$
8	$\frac{10 - 2(8)}{3}$	-2	$(8, -2)$

**Which ordered pairs are solutions of each equation?**

1.  $y = 3x + 1$       a.  $(0, 1)$       b.  $(\frac{1}{3}, 2)$       c.  $(-1, -\frac{2}{3})$       d.  $(-1, -2)$

2.  $2a = 5 - b$       a.  $(5, 0)$       b.  $(5, -5)$       c.  $(\frac{5}{2}, 0)$       d.  $(1, -3)$

**Solve each equation if the domain is  $\{-4, -2, 0, 2, 4\}$ .**

3.  $x + y = 4$

4.  $y = -4x - 6$

5.  $5a - 3b = 15$

6.  $3x - 5y = 8$

7.  $6x + 3y = 18$

8.  $4x + 8 = 6y$