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Use algebra tiles to model and solve each equation.

MODEL	ALGEBRA
<p>$1x = 3$</p>	<p>1. $3x + 2 = 2x + 5$</p> <p>$x = 3$</p>
	<p>2. $5x + 12 = 2x + 3$</p> <p>$3x = -9$ $x = -3$</p>
	<p>3. $9x - 5 = 6x + 13$</p> <p>$3x = 18$ $x = 6$</p>
	<p>4. $x = -2x + 9$</p> <p>$3x = 9$ $x = 3$</p>

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Solve $10x = 2x - 16$.

$$10x = 2x - 16$$

$$\underline{-2x} \quad \underline{-2x}$$

Add $-2x$ to both sides.

$$8x = -16$$

$$\frac{8x}{8} = \frac{-16}{8}$$

Divide both sides by 8.

$$x = -2$$

Check:

$$10x = 2x - 16$$

$$10(-2) \stackrel{?}{=} 2(-2) - 16$$

$$-20 \stackrel{?}{=} -4 - 16$$

$$-20 \stackrel{?}{=} -20 \checkmark$$

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Solve $3x = 5(x + 2)$.

$$3x = 5x + 10$$

Distribute.

$$\underline{-5x} \quad \underline{-5x}$$

Add $-5x$ to both sides.

$$-2x = 10$$

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

Divide both sides by -2 .

$$x = -5$$

Check:

$$3x = 5(x + 2)$$

$$3(-5) \stackrel{?}{=} 5(-5 + 2)$$

$$-15 \stackrel{?}{=} 5(-3)$$

$$-15 \stackrel{?}{=} -15 \checkmark$$

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$$4x + 2 = 5(x + 10)$$

$$4x + 2 = 5x + 50$$

$-4x$
 $-4x$

$$2 = x + 50$$

-50
 -50

$$-48 = x$$

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$$-10 + y + 3 = 4y - 13$$

$$y - 7 = 4y - 13$$

$-y$
 $-y$

$$-7 = 3y - 13$$

$+13$
 $+13$

$$\frac{6}{3} = \frac{3y}{3}$$

$$2 = y$$

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$$3(t + 7) + 2 = 6t - 2 + 2t$$

$$\begin{array}{r} 3t + 23 = 8t - 2 \\ -3t \quad -3t \end{array}$$

$$\therefore \begin{array}{r} 23 = 5t - 2 \\ +2 \quad +2 \end{array}$$

$$\begin{array}{r} 25 = 5t \\ \hline 5 \quad \hline 5 \end{array}$$

$$\boxed{5 = t}$$

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One electrician charges his customers a \$60 service fee plus \$35 per hour. Another electrician charges her customers \$65 per hour. How many hours must the electricians work in order for the total cost of an electrician to be the same? What is the total cost?

h = hours

Understand the Problem

- Describe how much the first electrician charges. 35h + 60
- Describe how much the second electrician charges. 65h

Make a Plan

- What do you need to determine? When cost is equal
- Let *h* represent the number of hours that the electricians must work. Write an equation to represent the situation.

Service fee for electrician #1	+	Hourly rate	·	Number of hours electrician #1 works	=	Hourly rate	·	Number of hours electrician #2 works
<u>60</u>		<u>35</u>		<i>h</i>		<u>65</u>		<i>h</i>

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Solve

5. On which side ~~should~~ ^{would} you collect the variable terms? Right

6. Solve the equation by isolating h .

$$\begin{aligned}
 60 + 35h &= 65h \\
 -35h &\quad -35h \\
 \hline
 60 &= 30h \\
 \frac{60}{30} &= \frac{30h}{30} \\
 2 &= h
 \end{aligned}$$

7. The number of hours that the electricians need to work for the total cost to be the same is 2 hours.

8. What is the total cost for either of the electricians to work for this number of hours? 130

Look Back

9. Substitute the solution for h into the equation you wrote in Exercise 4.

Service fee for electrician #1	+	Hourly rate	·	Number of hours electrician #1 works	=	Hourly rate	·	Number of hours electrician #2 works
<u>60</u>		<u>35</u>		<u>2</u>		<u>65</u>		<u>2</u>

10. Does your solution make the equation true? ✓

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