

TUESDAY, NOV. 13, 2012

Agenda

- TISK & MM
- Homework Discussion
- Lesson 10-3: Equations with Variables on Both Sides
- Homework: p. 510 #22-32

TISK Problems

- 1) Mika rolls a ten-sided die and spins a fair spinner numbered 1-10. Find $P(\text{even then odd})$.
- 2) Solve for n : $\frac{14}{21} = \frac{n}{3}$
- 3) Simplify: $-3(2y + 8) - 8y + 27$

There will be 2 Mental Math Questions today.

Homework Discussion

- 1) $x = 1$
- 2) $a = 7$
- 3) $x = 2$
- 4) $y = -4$
- 5) $x = 1$
- 6) $n = 2$
- 7) $d = 3$
- 8) $x = 7$

§10.3 Equations with Variables on Both Sides

• If variables are on both sides of the equation, add or subtract to get them all on one side.

$$\begin{array}{r} 7x + 19 = -2x + 55 \\ +2x \qquad \qquad +2x \\ \hline \end{array}$$

$$\begin{array}{r} 9x + 19 = 55 \\ -19 \qquad \qquad -19 \\ \hline \end{array}$$

How do you decide which side to pick on?

$$\begin{array}{r} 9x = 36 \\ \div 9 \qquad \div 9 \\ \hline \end{array}$$

Then, solve as usual!

$$x = 4$$

Examples. Solve the equation.

$$\begin{array}{r} 80 - 9y = 6y \\ +9y \quad +9y \\ \hline \end{array}$$

$$\begin{array}{r} 80 = 15y \\ 15 \quad 15 \\ \hline \end{array}$$

$$\frac{16}{3} = y$$

Examples. Solve the equation.

$$\begin{array}{r} 6x + 22 = -3x + 31 \\ +3x \quad \quad +3x \\ \hline \end{array}$$

$$\begin{array}{r} 9x + 22 = 31 \\ -22 \quad -22 \\ \hline \end{array}$$

$$\begin{array}{r} 9x = 9 \\ 9 \quad 9 \\ \hline \end{array}$$

$$x = 1$$

Check Point. Try it on your own.

$$64 - 12w = 6w$$

$$17 - 2x = 14 + 4x$$

$$2 - x = 7x - 14$$

Many Solutions & No Solutions

- Sometimes, when variables are on both sides of the equal sign, the variables "disappear".
- If that happens, there are either NO Solutions or "MANY" Solutions.

Examples. Solve the equation.

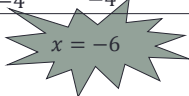
$$\begin{array}{r}
 4(x - 5) = 4x - 20 \\
 \hline
 4x - 20 = 4x - 20 \\
 -4x \quad -4x \\
 \hline
 -20 = -20 \\
 x = \text{any number}
 \end{array}$$

No Solution is DIFFERENT from ZERO. Zero is a number (and can be a solution!) but no solution means there is NO NUMBER that will make the equation work.

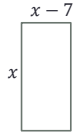
$$\begin{array}{r}
 3x - 9 = 3x + 10 \\
 \hline
 -3x \quad -3x \\
 \hline
 -9 = 10 \\
 x = \emptyset \quad (\text{this symbol means "no solution"})
 \end{array}$$

Examples. Solve the equation.

$$\begin{array}{r}
 4(1 - x) + 3x = -2(x + 1) \\
 4 - 4x + 3x = -2x - 2 \\
 4 - x = -2x - 2 \\
 +2x \quad +2x \\
 \hline
 4 + x = -2 \\
 -4 \quad -4 \\
 \hline
 x = -6
 \end{array}$$



Example. Both figures have the same perimeter. Find each perimeter.



$$P = 2l + 2w$$

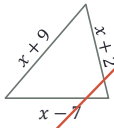
$$l = x$$

$$w = x - 7$$

$$P = 2x + 2(x - 7)$$

$$P = 2x + 2x - 14$$

$$P = 4x - 14$$



$$P = s_1 + s_2 + s_3$$

$$s_1 = x - 7$$

$$s_2 = x + 9$$

$$s_3 = x + 2$$

$$P = x - 7 + x + 9 + x + 2$$

$$P = 3x + 4$$

$$4x - 14 = 3x + 4$$

$$\begin{array}{r} 4x - 14 = 3x + 4 \\ -3x \quad -3x \\ \hline x - 14 = 4 \\ +14 \quad +14 \\ \hline x = 18 \end{array}$$

$$P = 3x + 4$$

$$P = 3(18) + 4$$

$$P = 54 + 4$$

$$P = 58$$
