

WEDNESDAY, NOV. 14, 2012

Agenda:

- TISK & MM
- HW Check
- Lesson 10-4 pt 1: Solve & Graph Inequalities
- Homework: p. 517-518 #27-37 odd & 40 (due on Fri!)

TISK Problems

- 1) Simplify: $7u - 2(-5u - 9) - 8$
- 2) Solve for x : $\frac{5}{x} = \frac{27}{6}$
- 3) Jack makes three free-throws out of every seven he attempts. What are his odds against making a free-throw?

We will have 2 Mental Math questions.

Homework Check

- 510 #22-32
- 22) $n = 3$
- 23) $n = 2$
- 24) $x = \emptyset$
- 25) $x = 5$
- 26) $p = 3$
- 27) $m = 3.5$
- 28) $x = 2$
- 29) $x = 7$
- 30) $r = 10$
- 31) 360 units
- 32) 28 units

§10-4 Solving Multi-Step Inequalities

- Inequalities are a way of stating a set of many answers.
 - For example:
 - $x < 9$
 - $x \geq 7$
 - We use **inequality symbols** to identify how the numbers are NOT equal.
 - $<$ means "**is** less than"
 - $>$ means "**is** greater than"
 - \leq means "**is** less than or equal to" or "is at most"
 - \geq means "**is** greater than or equal to" or "is at least"

§10-4 Solving Multi-Step Inequalities

Graphing Inequalities

- To show a solution to an inequality, you graph it using a number line to show all the possible numbers that could be solutions to the inequality.
- For example: $x < 9$



Which numbers are solutions to the inequality?
 (Which numbers are less than 9?)
 It is impossible to plot every solution individually, so we simply shade the line to indicate the solutions...

Important things to notice...



The arrow is shaded because the solutions continue past the point I've drawn the number line.

This circle is NOT filled in, because $x < 9$ but not equal to it.
 Circles with no filling are called "open circles".

If the problem was: $x \leq 9$
 then the solution would be...



Circles with filling are called "closed circles".

You Try it

Graph the inequality.



Solving Inequalities...

- When you solve inequalities, make sure your final answer has the variable on the left.
- Be careful when MULTIPLYING or DIVIDING by negative numbers..!
 • If you multiply or divide by a negative number, you have to flip the inequality sign.

Solve the inequality; graph the solution.

$2 \cdot \frac{1}{2}x > 3 \cdot 2$	$\frac{3x}{3} \leq \frac{9}{3}$	$-1 \cdot -x < 4 \cdot -1$	$\frac{-2x}{-2} \leq \frac{6}{-2}$
$x > 6$	$x \leq 3$	$x < -4$	$x \leq -3$

Check Point.

$\frac{p}{3} \leq -2$	$-25y > 30$
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Example. Solve the inequality.

$\begin{array}{r} 2y - 5 \leq 7 \\ +5 \quad +5 \\ \hline 2y = 12 \\ \frac{2}{2} \quad \frac{2}{2} \\ \hline y \leq 6 \end{array}$	$\begin{array}{r} 2x - 4 \geq 4x - 1 \\ -4x \quad -4x \\ \hline -2x - 4 = -1 \\ +4 \quad +4 \\ \hline -2x = 3 \\ \frac{-2}{-2} \quad \frac{-2}{-2} \\ \hline x \geq -\frac{3}{2} \end{array}$
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Checkpoints. Solve the inequality.

$$\begin{array}{r} -3x+1 \leq 22 \\ \underline{-1 \quad -1} \\ -3x \leq 21 \\ \underline{-3 \quad -3} \\ x \geq -7 \end{array} \quad \begin{array}{r} 5x-3 > 12 \\ \underline{+3 \quad +3} \\ 5x > 15 \\ \underline{5 \quad 5} \\ x > 3 \end{array} \quad \begin{array}{r} -x+1 \geq 3x+21 \\ \underline{+x \quad +x} \\ 1 \geq 4x+21 \\ \underline{-21 \quad -21} \\ -20 \geq 4x \\ \underline{4 \quad 4} \\ -5 \geq x \\ x \leq -5 \end{array}$$

Solve the inequality.

$$\begin{array}{r} 3x+5 \leq 2x-1 \\ \underline{-2x \quad -2x} \\ x+5 \leq -1 \\ \underline{-5 \quad -5} \\ x \leq -6 \end{array}$$



Solve the inequality.

$$\begin{array}{r} 6-x > 15 \\ \underline{+x \quad +x} \\ 6 > x+15 \\ \underline{-15 \quad -15} \\ -9 > x \\ x < -9 \end{array}$$



Solve the inequality.

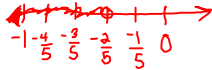
$$\frac{-2x+8}{+2x} > \frac{3x+10}{+2x}$$

$$\frac{8}{-10} > \frac{5x}{-10}$$

$$\frac{-2}{5} > \frac{5x}{5}$$

$$-\frac{2}{5} > x$$

$$x < -\frac{2}{5}$$



Solve the inequality.

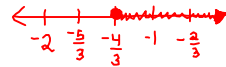
$$(x+6) \geq 2(1-x)$$

$$\frac{x+6}{+2x} \geq \frac{2-2x}{+2x}$$

$$\frac{3x+6}{-6} \geq \frac{2}{-6}$$

$$\frac{3x}{3} \geq \frac{-4}{3}$$

$$x \geq -\frac{4}{3}$$



Solve the inequality.

$$\frac{2}{3}x + 2 \leq 4$$

$$\frac{2}{3} \left(\frac{2}{3}x \right) \leq \left(\frac{2}{3} \right) 2$$

$$x \leq 3$$
