Section 1-5
Solving Inequalities

Students will be able to:
   -solve and graph inequalities
   -write and solve compound inequalities

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You are going to download some music onto your IPod. Each song uses about 4.3 MB of space. You have 7.8 GB of free space on the IPod. At most, how many songs can you download?
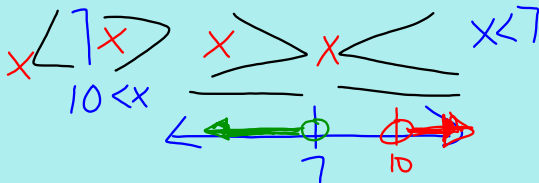
$$7.8 \times 1000 = \frac{7800 \, MB}{4.3 \, mB}$$

$$x \le 1813$$

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"At most" and "at least" suggest that two quantities are not equal, and this will be represented by an inequality.

What are the symbols for inequalities and what are the word phrases represented by them? Give an example of each and graph.

$$< \qquad > \qquad \le \qquad x < 7$$
$$10 < x$$

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Write the inequality represented by the following word phrases:

The quotient of a number and 3 is no more than 15.

$$3 \cdot \frac{x}{3} \le 15 \cdot 3 \qquad x \le 45$$

The product of 7 and a number is at least 50.

$$7x \ge 50$$

Solve and graph.

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Open to page 34 and read through the properties of inequalities.

What do we have to remember about multiplying and dividing by a negative?

Switch the sign

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Plumber A charges $75 for a service charge and $40 per hour. Plumber B charges $50 per hour but no service charge. How many hours must a plumbing job last for Plumber A to cost less than Plumber B?

$$75 + 40x < 50x$$
$$\underline{-40x} \qquad \underline{-40x}$$
$$\frac{75}{10} < \frac{10x}{10} \qquad x > 7.5$$

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Are the following *always, sometimes, or never true?* Explain.

1. $3(x + 3) \geq 3(2 + x)$

$3x + 9 \geq 6 + 3x$

$-3x \qquad -3x$

Always

2. $9 - x - 5 < -x + 4$

$3 \leq 2$ $4 - x < -x + 4$

$+x \qquad +x$

$4 < 4$

Never

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Define:

Compound Inequality

Combine w/

'and' or 'or'

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How are the solutions to an "and" compound inequality different from those to an "or" compound inequality?

'and' is very restrictive

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Solve and graph:

$-6 < 2x - 4 < 12$

$-6 < 2x - 4$ and $2x - 4 < 12$

$+4 \qquad +4$ $+4 \quad +4$

$\frac{-2}{2} < \frac{2x}{2}$ $\frac{2x}{2} < \frac{16}{2}$

$-1 < x$ -1 8 $x < 8$

Is this inequality *always, sometimes or never true?* Sometimes $-1 < x < 8$

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Hwk: pg. 38 - 40

#24 - 42 evens, 44, 50, 52, 54, 58, 64

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