C: Solving Multi-step Inequalities

★ flip sign if you multiply or divide by a negative

Examples:

1. Solve the inequality and verify the solution.

a) $10x - 38 < 72$

$+38 \quad +38$

$\frac{10x}{10} < \frac{110}{10}$

$\boxed{x < 11}$

Verify:

$x = 10$

$10x - 38 < 72$

$10(10) - 38 < 72$

$100 - 38 < 72$

$62 < 72$ ✓

b) $\frac{1}{2}(x + 10) > 220$

$\left(\frac{1}{2}x\right)^2 + \left(\frac{5}{1}\right)^2 > \left(\frac{220}{1}\right)^2$

$x + 10 > 440$

$-10 \quad -10$

$x > 430$

Verify:

$x = 431$

$\frac{1}{2}(431 + 10) > 220$

$\frac{1}{2}(441) > 220$

$\frac{441}{2} > 220$

$220.5 > 220$ ✓

2. Solve.

a) $-10y + 184 \geq 80$

$-184 \quad -184$

$\frac{-10y}{-10} \geq \frac{-104}{-10}$

$y \leq \frac{52}{5}$

b) $6.8 - 2.6y < y - 4.4$

$-y \quad -y$

$6.8 - 3.6y < -4.4$

$-6.8 \quad -6.8$

$\frac{-3.6y}{-3.6} < \frac{-11.2}{-3.6}$

$y > 3.\overline{1}$

c) $\frac{3}{2}\frac{9}{4}y - 3 \geq -\frac{3}{4}(3 - 6y)$

$\left(\frac{9}{4}y\right)^{4}(-3) \geq \left(-\frac{9}{4}\right)^{4} + \left(\frac{9}{2}y\right)^{4}$

$9y - 12 \geq -9 + 18y$

$-18y \qquad -18y$

$-9y - 12 \geq -9$

$+12 \qquad +12$

$\frac{-9y}{-9} \geq \frac{3}{-9}$

$y \geq -\frac{1}{3}$

3. Verify that $x \geq 8$ is the correct solution to the inequality $6x + 22 \geq 70$

$6x + 22 \geq 70$

$-22 \quad -22$

$\frac{6x}{6} \geq \frac{48}{6}$

$x \geq 8$

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⇑

Correct Solution.

Assignment. Pg. 365 #3-7, 17, 18, 21