

WORKSHOP: Linear Equations, Inequalities & Absolute Value

Linear Equations

First, let's practice some challenging linear equations:

$$1) \quad 5 + 2(4x - 4) = 3(2x - 1)$$

$$2) \quad \frac{2}{3}x - \frac{3}{4} = \frac{1}{6}x + \frac{21}{4}$$

$$3) \quad \frac{3}{5}(5x + 10) = \frac{5}{6}(12x - 18)$$

$$4) \quad \frac{2}{3}(6x - 1) + \frac{2}{3} = 4$$

Linear Inequalities

Now, let's review some inequality notation:

Cross out the mathematical statements that are **not true**:

$$3 < 7 \quad -4 > 2 \quad 5 > -1 \quad -4 > -2 \quad -13 < -1 \quad -1 > 5$$

Then **graph** the following statements on a **number line**:

$$x > -3 \quad 4 \geq x \quad -5 < x \quad x \leq -5$$

Now solve the following linear inequalities and graph on a number line:

a) $\frac{2}{3}x < 4$

b) $\frac{1}{4}t - \frac{1}{3}(2t - 5) < 0$

c) $-2 \leq 5 - 7(2a + 3)$

Absolute Value Equations & Inequalities

First, let's graph the following on a number line:

$$|x| = 3$$

$$|x| \leq 3$$

$$|x| > 3$$

Now, let's practice some problems (graph each on a number line):

a) $1 = |3 - x|$

b) $\left| \frac{2}{7}a + \frac{3}{4} \right| = 1$

c) $1 = -3 + \left| 2 - \frac{1}{4}y \right|$

d) $|x + 4| < 2$

e) $|2k - 5| \geq 3$

f) $\left|3 - \frac{3}{4}x\right| > 9$

g) $|t| + 5 < 2$

h) $|x + 2| + 3 \geq 2$