

PR-3 Homework

Wednesday, January 11, 2017
7:40 AM

CAT Homework PR-3 Solving Equations & Inequalities

Key

Part 1: Solve each equation algebraically. Use your graphing calculator to verify answers.

(Exact answers. No approximations)

1. $4 - 2x = 3x - 6$

$$10 = 5x$$

$$\boxed{2 = x}$$

$$\frac{2}{2} \cdot \frac{2}{3} x = \frac{4}{5} \cdot \frac{3}{2}$$

$$\boxed{x = \frac{6}{5} \text{ or } 1.2}$$

3. $3(5z - 3) + 4(2z + 1) = 5z - 2$

$$15z - 9 + 8z + 4 = 5z - 2$$

$$23z - 5 = 5z - 2$$

$$\frac{18z}{18} = \frac{3}{18}$$

$$\boxed{z = \frac{1}{6}}$$

4. $\frac{t-1}{3} + \frac{t+5}{4} = \frac{1}{2}$ LCD: 12

$$4t - 4 + 3t + 15 = 6$$

$$7t + 11 = 6$$

$$7t = -5$$

$$\boxed{t = -\frac{5}{7}}$$

5. $(\sqrt{x})^2 = (15)^2$

$$\boxed{x = 225}$$

6. $|2x + 5| = 7$

$$2x + 5 = 7 \quad 2x + 5 = -7$$

$$2x = 2$$

$$2x = -12$$

$$\boxed{x = 1}$$

$$\boxed{x = -6}$$

7. $|x + 1| = 2x - 3$

$$x + 1 = 2x - 3$$

$$\boxed{4 = x}$$

$$x + 1 = -2x + 3$$

$$-2 = -3x$$

~~$$\frac{2}{-3} = \frac{-2}{-3}$$~~

$$\frac{2}{3} \neq \frac{-2}{3}$$

Check

$$|5| = 5$$

$$5 = 5$$

8. $\frac{x+3}{x-7} = \frac{2}{5}$

$$5x + 15 = 2x - 14$$

$$3x = -29$$

$$\boxed{x = -9 \frac{2}{3}}$$

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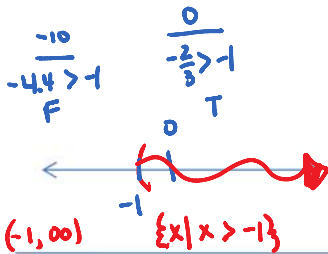
Part 2: Solve each inequality algebraically and graphically.

Graph the solution on an x-axis number line. Write the solution in set-builder notation *and* interval notation.

Ex. $x - 4 > 5$ Graph:  Set-builder: $\{x | x > 9\}$ Interval: $(9, \infty)$

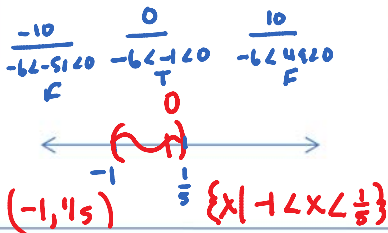
9. $\frac{3x-2}{5} > -1$

$3x - 2 = -5$
 $3x = -3$
 $x = -1$



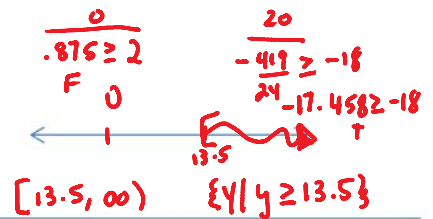
10. $-6 < 5t - 1 < 0$

$-6 = 5t - 1$ $5t - 1 = 0$
 $-5 = 5t$ $5t = 1$
 $-1 = t$ $t = \frac{1}{5}$



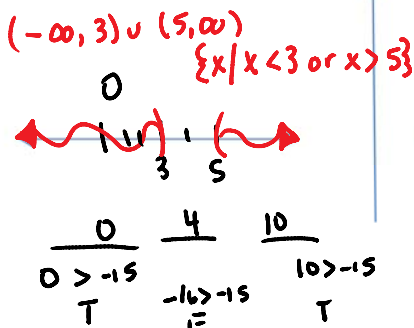
11. $\frac{3-4y}{6} + \frac{-2y+3}{8} \geq 2-y$ L.O.D: 24

$12 - 16y - 6y + 9 = 48 - 24y$
 $-22y + 21 = 48 - 24y$
 $2y = 27$
 $y = 13.5$



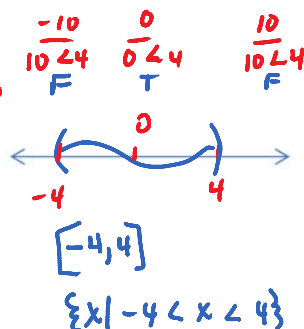
12. $x^2 - 8x > -15$

$x^2 - 8x + 15 = 0$
 $(x-5)(x-3) = 0$
 $x = 5, 3$



13. $|x| < 4$

$|x| = 4$
 $x = 4$ $x = -4$



14. $x^3 - x^2 - 30x \leq 0$

$x(x^2 - x - 30) = 0$
 $x(x-6)(x+5) = 0$
 $x = 0, 6, -5$

