

Write in a neat and organized fashion. You should use a pencil. For an exercise to be complete there needs to be a detailed solution to the problem. Do not just write down an answer. No proof, no credit given.

Solve the following inequalities.

Graph the solution set.

Express the solution set in interval notation.

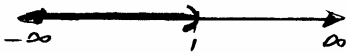
$$1) \quad 2x - 11 < -3(x + 2)$$

$$2x - 11 < -3x - 6$$

$$2x + 3x < -6 + 11$$

$$5x < 5 \quad /:5$$

$$\boxed{x < 1}$$



$$\boxed{x \in (-\infty, 1)}$$

$$2) \quad \boxed{4} < \left(1 - \frac{x}{3}\right) \leq \boxed{-6}$$

contradiction

$\boxed{\text{NO SOLUTIONS}}$

$$\boxed{x \in \emptyset}$$

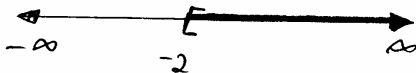
$$3) \quad \frac{3}{10}x + 1 \geq \frac{1}{5} - \frac{x}{10} \quad \text{LCD} = 10$$

$$3x + 10 \geq 2 - x$$

$$3x + x \geq 2 - 10$$

$$4x \geq -8 \quad /:4$$

$$\boxed{x \geq -2}$$



$$\boxed{x \in [-2, \infty)}$$

$$\begin{aligned}
 4) \quad & 4(3x-5) - 3x < 3(1+3x-7) \\
 & 12x - 20 - 3x < 3(3x-6) \\
 & \cancel{9x} - 20 < \cancel{9x} - 18 \\
 & -20 < -18 \\
 & \text{identity}
 \end{aligned}$$

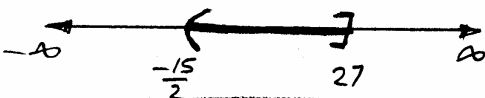
$$x \in \mathbb{R}$$



$$x \in (-\infty, \infty)$$

$$\begin{aligned}
 5) \quad & -13 \leq 5 - \frac{2}{3}x < 10 \quad | \cdot 3 \\
 & -13 \cdot 3 \leq 3 \left( 5 - \frac{2}{3}x \right) < 10 \cdot 3 \\
 & -39 \leq 15 - 2x < 30 \quad | -15 \\
 & -39 - 15 \leq -2x < 30 - 15 \\
 & -54 \leq -2x < 15 \quad | \div (-2) \\
 & \frac{-54}{-2} \geq \frac{-2x}{-2} > \frac{15}{-2} \\
 & 27 \geq x > -\frac{15}{2}
 \end{aligned}$$

$$-\frac{15}{2} < x \leq 27$$



$$x \in \left(-\frac{15}{2}, 27\right]$$