

Solve the following and represent your solutions using interval notation

1. $3x - 15 < 45$

$$3x < 45 + 15$$

$$3x < 60$$

$$x < 60/3$$

$$x < 20$$

Interval notation: $(-\infty, 20)$

2. $2p - 22 \geq 4p + 14$

$$2p \geq 4p + 14 - 22$$

$$2p \geq 4p - 8$$

$$2p - 4p \geq -8$$

$$-2p \geq -8$$

$$-2p/-2 \leq -8/-2 \text{ (note direction of inequality sign changes when dividing by a negative quantity)}$$

$$p \leq -4$$

Interval notation: $(-\infty, 7]$.

3. $7y + 12 > 46 - 10y$

$$7y > 46 - 10y - 12$$

$$7y > 38 - 10y$$

$$7y + 10y > 38$$

$$17y > 38$$

$y > 38/17$ Interval notation: $(38/17, +\infty)$

4. $3(m + 2) \leq 6(2m - 5)$

$$3m + 6 \leq 12m - 30$$

$$3m \leq 12m - 30 - 6$$

$$3m \leq 12m - 36$$

$$3m - 12m \leq -36$$

$$-9m \leq -36$$

$$m \geq -36/-9 \text{ (note direction of sign changes upon dividing by a negative quantity)}$$

$$m \geq 4$$

Interval notation: $[4, +\infty)$

5. $5(y + 3) > 2(4y - 6)$

$$5y + 15 > 8y - 12$$

$$5y > 8y - 12 - 15$$

$$5y > 8y - 27$$

$$5y - 8y > -27$$

$$-3y > -27$$

$$y < -27/-3 \text{ (note direction of sign changes upon dividing by a negative quantity)}$$

$$y < 9$$

Interval Notation: $(-\infty, 9)$

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