

1. Solve each equation.

a) $-31.25 = y + 3.5$

$$-31.25 - 3.5 = y + 3.5 - 3.5$$

$$-34.5 = y$$

b) $4x = 20.8$

$$\frac{4x}{4} = \frac{20.8}{4}$$

$$x = 5.2$$

c) $-76.05 = -9b$

$$\frac{-76.05}{-9} = \frac{-9b}{-9}$$

$$8.45 = b$$

d) $\frac{p}{2.5} = -5.5$

$$2.5\left(\frac{p}{2.5}\right) = 2.5(-5.5)$$

$$p = -13.75$$

2. Solve each equation.

a) $\frac{y}{4} - 2 = 9$

$$\frac{y}{4} - 2 + 2 = 9 + 2$$

$$\frac{y}{4} = 11$$

$$4\left(\frac{y}{4}\right) = 4(11)$$

$$y = 44$$

b) $-12 = \frac{x}{3} + 4$

$$-12 - 4 = \frac{x}{3} + 4 - 4$$

$$-16 = \frac{x}{3}$$

$$3(-16) = 3\left(\frac{x}{3}\right)$$

$$-48 = x$$

c) $5.1 - 0.5g = 1.5$

$$5.1 - 5.1 - 0.5g = 1.5 - 5.1$$

$$-0.5g = -3.6$$

$$\frac{-0.5g}{-0.5} = \frac{-3.6}{-0.5}$$

$$g = 7.2$$

d) $\frac{-3r}{4} = 1.38$

$$4\left(\frac{-3r}{4}\right) = 4(1.38)$$

$$-3r = 5.52$$

$$\frac{-3r}{-3} = \frac{5.52}{-3}$$

$$r = -1.84$$

e) $9 - \frac{3}{4}k = 5$

$$9 - 9 - \frac{3}{4}k = 5 - 9$$

$$-\frac{3}{4}k = -4$$

$$4\left(-\frac{3}{4}k\right) = 4(-4)$$

$$-3k = -16$$

$$\frac{-3k}{-3} = \frac{-16}{-3}$$

$$k = \frac{16}{3} \text{ or } 5\frac{1}{3}$$

3. A taxicab charges \$3.50, plus \$1.78 per kilometre.
How long is a trip that costs \$22.19?

Let $k = \#$ of km.

$$1.78k + 3.5 = 22.19$$

$$1.78k + 3.5 - 3.5 = 22.19 - 3.5$$

$$1.78k = 18.69$$

$$k = 10.5$$

The trip is 10.5 km.

4. Solve each equation.

$$\begin{aligned} \text{a)} \quad -2(2-x) &= -6 \\ -4 + 2x &= -6 \\ -4 + 4 + 2x &= -6 + 4 \\ 2x &= -2 \\ \frac{2x}{2} &= \frac{-2}{2} \\ x &= -1 \end{aligned}$$

$$\begin{aligned} \text{b)} \quad 3.2(v-3) &= 12.8 \\ 3.2v - 9.6 &= 12.8 \\ 3.2v - 9.6 + 9.6 &= 12.8 + 9.6 \\ 3.2v &= 22.4 \\ \frac{3.2v}{3.2} &= \frac{22.4}{3.2} \\ v &= 7 \end{aligned}$$

$$\text{c)} \quad 6\left(m - \frac{1}{9}\right) = \frac{55}{12}$$

$$\begin{aligned} 6m - \frac{6}{9} &= \frac{55}{12} \\ 36\left(6m - \frac{6}{9}\right) &= 36\left(\frac{55}{12}\right) \\ 216m - \frac{216}{9} &= \frac{1980}{12} \\ 216m - 24 &= 165 \\ 216m - 24 + 24 &= 165 + 24 \\ 216m &= 189 \\ \frac{216m}{216} &= \frac{189}{216} \\ m &= \frac{189}{216} \\ m &= \frac{7}{8} \end{aligned}$$

$$\text{d)} \quad -\frac{16}{9} = \frac{2}{3}\left(\frac{5}{2} - g\right)$$

$$\begin{aligned} -\frac{16}{9} &= \frac{10}{6} - \frac{2g}{3} \\ 9\left(-\frac{16}{9}\right) &= 9\left(\frac{10}{6} - \frac{2g}{3}\right) \\ -16 &= \frac{90}{6} - \frac{18g}{3} \\ -16 &= 15 - 6g \\ -16 - 15 &= 15 - 15 - 6g \\ -31 &= -6g \\ \frac{-31}{6} &= \frac{-6g}{-6} \\ \frac{-31}{6} &= g \end{aligned}$$

5. Solve each equation. Verify one of the solutions.

$$\text{a)} \quad 4y - 24 = 10y$$

$$\begin{aligned} 4y - 4y - 24 &= 10y - 4y \\ -24 &= 6y \\ \frac{-24}{6} &= \frac{6y}{6} \\ -4 &= y \end{aligned}$$

$$\text{b)} \quad 4a - 8 = -6a$$

$$\begin{aligned} 4a - 4a - 8 &= -6a - 4a \\ -8 &= -10a \\ \frac{-8}{-10} &= \frac{-10a}{-10} \\ \frac{8}{10} &= a \\ \frac{4}{5} &= a \end{aligned}$$

$$\text{c)} \quad -28.6 + 4w = -2w + 9.8$$

$$\begin{aligned} -28.6 + 4w + 2w &= -2w + 2w + 9.8 \\ -28.6 + 6w &= 9.8 \\ -28.6 + 28.6 + 6w &= 9.8 + 28.6 \\ 6w &= 38.4 \\ \frac{6w}{6} &= \frac{38.4}{6} \end{aligned}$$

$$w = 6.4$$

$$\text{d)} \quad -25.2d = 12.2d + 149.6$$

$$\begin{aligned} -25.2d - 12.2d &= 12.2d - 12.2d + 149.6 \\ -37.4d &= 149.6 \\ \frac{-37.4d}{-37.4} &= \frac{149.6}{-37.4} \\ d &= \frac{149.6}{-37.4} \\ d &= -4 \end{aligned}$$

$$\text{e)} \quad \frac{45.5}{k} = -3.5$$

$$\begin{aligned} k\left(\frac{45.5}{k}\right) &= k(-3.5) \\ 45.5 &= -3.5k \\ \frac{45.5}{-3.5} &= \frac{-3.5k}{-3.5} \\ -13 &= k \end{aligned}$$

6. The sum of six times a number, plus ten is equal to fourteen less than fourteen times the number. Write an equation to model this situation. Solve the equation to determine the number. Verify the solution.

Let x equal the number.

Verify: Left Side

Right side

$$\begin{aligned} 6x + 10 &= 14x - 14 \\ 6x - 14x + 10 &= 14x - 14x - 14 \\ -8x + 10 &= -14 \\ -8x + 10 - 10 &= -14 - 10 \\ -8x &= -24 \\ \frac{-8x}{-8} &= \frac{-24}{-8} \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 6x + 10 & & 14x - 14 \\ = 6(3) + 10 & & = 14(3) - 14 \\ = 18 + 10 & & = 42 - 14 \\ = 28 & & = 28 \end{aligned}$$

7. Solve each equation.

a) $4(m-1) = -6(m+3)$

$$4m - 4 = -6m - 18$$

$$4m + 6m - 4 = -6m + 6m - 18$$

$$10m - 4 = -18$$

$$10m - 4 + 4 = -18 + 4$$

$$10m = -14$$

$$\frac{10m}{10} = \frac{-14}{10}$$

$$m = \frac{-14}{10}$$

$$m = \frac{-7}{5}$$

b) $8.2(2-p) = -2.05(p-0.5)$

$$16.4 - 8.2p = -2.05p + 1.025$$

$$16.4 - 8.2p + 2.05p = -2.05p + 2.05p + 1.025$$

$$16.4 - 6.15p = 1.025$$

$$16.4 - 16.4 - 6.15p = 1.025 - 16.4$$

$$-6.15p = -15.375$$

$$\frac{-6.15p}{-6.15} = \frac{-15.375}{-6.15}$$

$$p = 2.5$$

c) $\frac{3}{4}(2x-3) = \frac{6}{5}(3x+1)$

$$\frac{6x}{4} - \frac{9}{4} = \frac{18x}{5} + \frac{6}{5}$$

$$20\left(\frac{6x}{4} - \frac{9}{4}\right) = 20\left(\frac{18x}{5} + \frac{6}{5}\right)$$

$$\frac{120x}{4} - \frac{180}{4} = \frac{360x}{5} + \frac{120}{5}$$

$$30x - 45 = 72x + 24$$

$$30x - 72x - 45 = 72x - 72x + 24$$

$$-42x - 45 = 24$$

$$-42x - 45 + 45 = 24 + 45$$

$$-42x = 69$$

$$\frac{-42x}{-42} = \frac{69}{-42}$$

$$x = \frac{69}{-42}$$

$$x = -\frac{23}{14} \text{ or } -1\frac{9}{14}$$

d) $\frac{2b}{3} + \frac{11}{4} = 3 - \frac{11b}{6}$

$$12\left(\frac{2b}{3} + \frac{11}{4}\right) = 12\left(3 - \frac{11b}{6}\right)$$

$$\frac{24b}{3} + \frac{132}{4} = 36 - \frac{132b}{6}$$

$$8b + 33 = 36 - 22b$$

$$8b + 22b + 33 = 36 - 22b + 22b$$

$$40b + 33 = 36$$

$$40b + 33 - 33 = 36 - 33$$

$$40b = 3$$

$$\frac{40b}{40} = \frac{3}{40}$$

$$b = \frac{3}{40}$$

$$b = \frac{1}{10}$$

8. State 3 values of the variable that satisfy each inequality.

a) $y < 9$

b) $b \geq -7$

c) $8 < x$

d) $-5 \geq k$

8,7,6

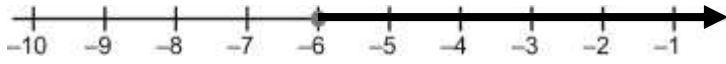
-6,-5,-4

9,10,11

-5,-6,-7

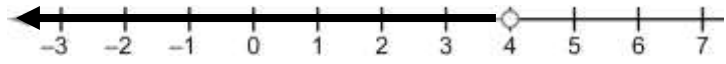
9. Write the inequality that is graphed on each number line.

a)



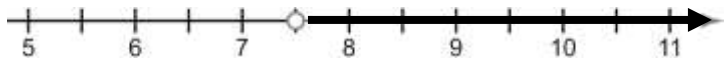
$y \geq -6$

b)



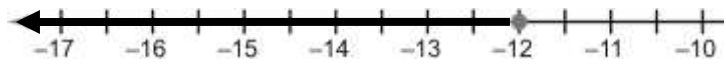
$y < 4$

c)



$y > 7.5$

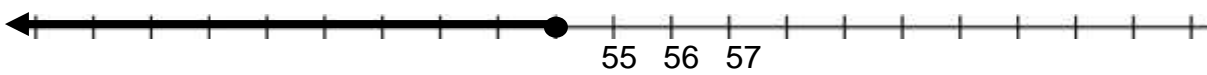
d)



$y \leq -12$

10. Write an inequality to describe each situation, then graph it.

a) The gas tank in a car contains no more than 55 L of gas. $y \leq 55$



b) The minimum age you must be to watch the movie is 13. $y \geq 13$



11. Match each inequality with the graph of its solution.

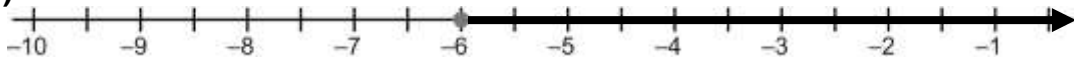
a) $g + 3 < 9$

b) $5 \geq m - 2$

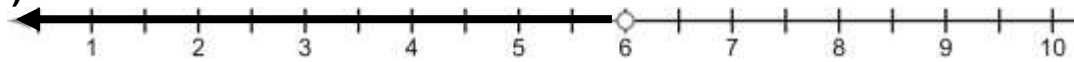
c) $2 + y \geq -4$

d) $-1 < f + 3$

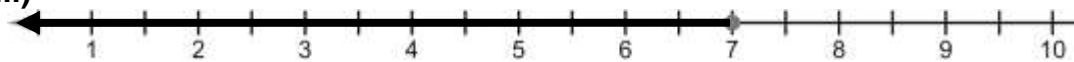
i)



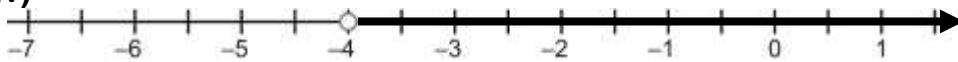
ii)



iii)



iv)



Answer: a matches with ii, b matches with iii, c matches with i, d matches with iv

12. Solve, then graph each inequality.

a) $7t - 4 > 3t + 12$

$$7t - 3t - 4 > 3t - 3t + 12$$

$$4t - 4 > 12$$

$$4t - 4 + 4 > 12 + 4$$

$$4t > 16$$

$$\frac{4t}{4} > \frac{16}{4}$$

$$t > 4$$



b) $4.2s - 15.25 \leq 4 - 1.3s$

$$4.2s + 1.3s - 15.25 \leq 4 - 1.3s + 1.3s$$

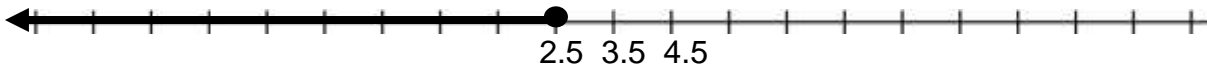
$$5.5s - 15.25 \leq 4$$

$$5.5s - 15.25 + 15.25 \leq 4 + 15.25$$

$$5.5s \leq 19.25$$

$$\frac{5.5s}{5.5} \leq \frac{19.25}{5.5}$$

$$s \leq 3.5$$



13. Do not solve each inequality. Determine which of the given numbers are solutions of the inequality.

a) $3t < -5$

-3, 0, 1

b) $5 - 3d \geq 2 - d$

-5, 0, 5

Answer: -3

Answer: -5 and 0

14. Solve each inequality and graph the solution.

a) $-3.5a < -1.3a + 6.6$

$$-3.5a + 1.3a < -1.3a + 1.3a + 6.6$$

$$-2.2a < 6.6$$

$$\frac{-2.2a}{-2.2} < \frac{6.6}{-2.2}$$

$$a > -3$$



b) $-\frac{5f}{6} - \frac{2}{3} > \frac{4}{3}$

$$6\left(-\frac{5f}{6} - \frac{2}{3}\right) > 6\left(\frac{4}{3}\right)$$

$$-\frac{30f}{6} - \frac{12}{3} > \frac{24}{3}$$

$$-5f - 4 > 8$$

$$-5f - 4 + 4 > 8 + 4$$

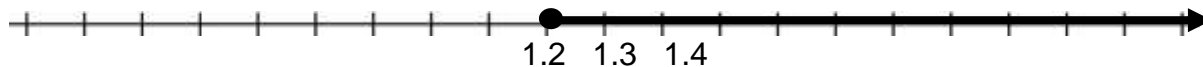
$$-5f > 12$$

$$\frac{-5f}{-5} < \frac{12}{-5}$$

$$f < -\frac{12}{5} \text{ or } -2.4$$



$$\begin{aligned}
 \text{c)} \quad & 1.3 - 2.5x \leq -1.1x - 0.52 \\
 & 1.3 - 2.5x + 1.1x \leq -1.1x + 1.1x - 0.52 \\
 & \quad 1.3 - 1.4x \leq -0.52 \\
 & 1.3 - 1.3 - 1.4x \leq -0.52 - 1.3 \\
 & \quad -1.4x \leq -1.82 \\
 & \quad \frac{-1.4x}{-1.4} \leq \frac{-1.82}{-1.4} \\
 & \quad x \geq 1.3
 \end{aligned}$$



15. Nadia gets paid \$1000 per month plus 5% commission on her sales. She wants to earn at least \$2200 this month. Write an inequality to represent this situation, then solve it to determine how much Nadia must sell to reach her goal.

Let x represent the sales.

$$\begin{aligned}
 & 0.05x + 1000 \geq 2200 \\
 & 0.05x + 1000 - 1000 \geq 2200 - 1000 \\
 & \quad 0.05x \geq 1200 \\
 & \quad \frac{0.05x}{0.05} \geq \frac{1200}{0.05} \\
 & \quad x \geq 24000
 \end{aligned}$$

She must sell at least \$24 000 worth of goods.