

Each of the 18 questions is worth 5 points plus 1 points for each of 10 homework problems for a total of 100

Solve the equation.

$$1) -[8x + (2x + 7)] = 1 - (9x + 3)$$

$$-8x - (2x + 7) = 1 - 9x - 3$$

$$-8x - 2x - 7 = 1 - 9x - 3$$

$$-10x - 7 = -9x - 3$$

$$10x + 7 = 9x + 2$$

$$\begin{array}{r} -9x - 7 \\ \hline -9x - 7 \end{array}$$

$$\boxed{x = -5}$$

$$2) \frac{3x+8}{5} + \frac{7}{5} = -\frac{7x}{4}$$

$$20 \left[\frac{3x+8}{5} + \frac{7}{5} \right] = - \left[\frac{7x}{4} \right] 20$$

$$4(3x+8) + 4 \cdot 7 = -35x$$

$$12x + 32 + 28 = -35x$$

$$12x + 60 = -35x$$

$$\begin{array}{r} +35x - 60 \\ \hline +35x - 60 \end{array}$$

$$47x = -60$$

$$\frac{47x}{47} = \frac{-60}{47}$$

$$\boxed{x = -\frac{60}{47}}$$

Solve the equation for the specified variable. Use the distributive property to factor as necessary.

$$3) w = \frac{8y-x}{y} \text{ for } y$$

$$wy = 8y - x$$

$$\begin{array}{r} -8y \quad -8y \\ \hline \end{array}$$

$$yw - y8 = -x$$

$$y(w-8) = -x$$

$$\boxed{y = \frac{-x}{w-8}}$$

Solve the percent problem.

- 4) Midtown Antiques collects 2% sales tax on all sales. If total sales including tax are \$1790.78, find the portion that is the tax. Round your answer to the nearest cent.

$$x + 0.02x = 1790.78$$

$$\frac{1.02x}{1.02} = \frac{1790.78}{1.02}$$

$$x = 1755.666\dots$$

$$\text{SALES} = x = 1755.67 \text{ (ROUNDED)}$$

$$\begin{array}{r} 1790.78 \\ - 1755.67 \\ \hline 35.11 \end{array}$$

$$\text{TAX} = \$35.11$$

Solve the mixture problem.

- 5) How many liters of a 30% alcohol solution must be mixed with 60 liters of a 50% solution to get a 40% solution?

QUAN.	%	ALCOHOL
L	.30	.30L
60	.50	.50x60
L+60	.40	.40(L+60)

$$\begin{aligned} .30L + .50 \times 60 &= .40(L+60) \\ 30L + 50 \cdot 60 &= 40(L+60) \\ 30L + 3000 &= 40L + 2400 \\ -40L - 3000 &\quad \quad -40L - 3000 \\ \hline \end{aligned}$$

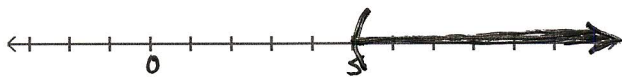
$$\frac{-10L}{-10} = \frac{-600}{-10}$$

$$L = 60$$

$$60 \text{ LITERS}$$

Solve the inequality. Give the solution set in both interval and graph forms.

6) $-3z - 2 > -4z + 3$

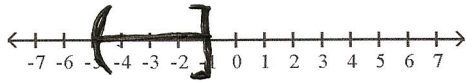


$$\begin{array}{r} -3z - 2 > -4z + 3 \\ +4z + 2 \quad +4z + 2 \\ \hline \end{array}$$

$$z > 5$$

$$(5, \infty)$$

7) $-5 < 2b + 5 \leq 3$



$(-5, -1]$

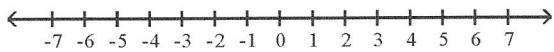
$$\begin{array}{r} -5 < 2b + 5 \leq 3 \\ \underline{-5} \quad \underline{-5} \quad \underline{-5} \end{array}$$

$$\frac{-10 < 2b \leq -2}{2} \quad \frac{-10 < 2b \leq -2}{2}$$

$$-5 < b \leq -1$$

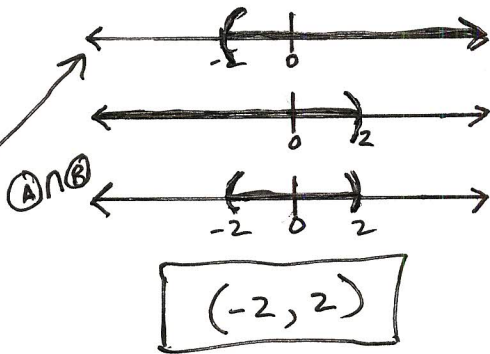
For the compound inequality, give the solution set in both interval and graph forms.

8) $-12 < 3x - 6$ and $8x - 4 < 12$

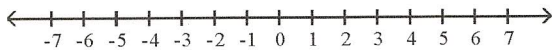


Ⓐ $-12 < 3x - 6$
 $\underline{+6} \quad \underline{+6}$
 $\frac{-6 < 3x}{3} \quad \frac{-6 < 3x}{3}$
 $-2 < x$

Ⓑ $8x - 4 < 12$
 $\underline{+4} \quad \underline{+4}$
 $\frac{8x < 16}{8} \quad \frac{8x < 16}{8}$
 $x < 2$

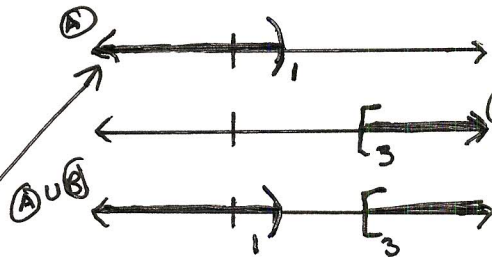


9) $6x - 4 < 2x$ or $-4x \leq -12$



Ⓐ $6x - 4 < 2x$
 $\underline{-2x + 4} \quad \underline{-2x + 4}$
 $\frac{4x < 4}{4} \quad \frac{4x < 4}{4}$
 $x < 1$

Ⓑ $-4x \leq -12$
 $\underline{-4} \quad \underline{-4}$
 $x \geq 3$



$(-\infty, 1) \cup [3, \infty)$

Solve the equation.

10) $|6m + 5| = 6$

$$\begin{array}{r} 6m + 5 = 6 \\ -5 \quad -5 \\ \hline 6m = 1 \\ \frac{6m}{6} = \frac{1}{6} \\ m = \frac{1}{6} \end{array}$$

$$\begin{array}{r} 6m + 5 = -6 \\ -5 \quad -5 \\ \hline 6m = -11 \\ \frac{6m}{6} = \frac{-11}{6} \\ m = -\frac{11}{6} \end{array}$$

$$m = \left\{ \frac{1}{6}, -\frac{11}{6} \right\}$$

Solve the given equation or inequality. If an equation is given, then write the solution set in set notation. If an inequality is given, then write the solution set in interval notation.

11) $|8k + 4| + 7 < 12$

$$\begin{array}{r} |8k + 4| + 7 < 12 \\ -7 \quad -7 \\ \hline |8k + 4| < 5 \end{array}$$

$$\begin{array}{r} 8k + 4 < 5 \\ -4 \quad -4 \\ \hline 8k < 1 \\ \frac{8k}{8} < \frac{1}{8} \\ k < \frac{1}{8} \end{array}$$

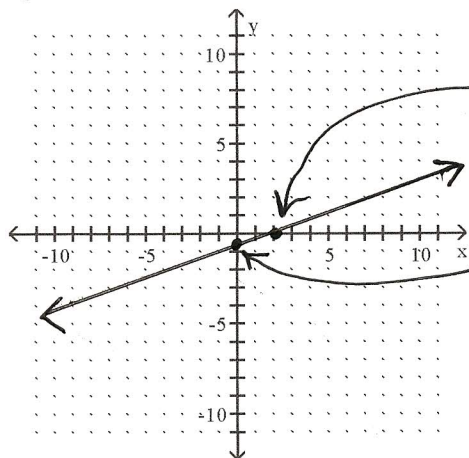
$$\begin{array}{r} 8k + 4 > -5 \\ -4 \quad -4 \\ \hline 8k > -9 \\ \frac{8k}{8} > \frac{-9}{8} \\ k > -\frac{9}{8} \end{array}$$

AND $k > -\frac{9}{8}$

$$\left(-\frac{9}{8}, \frac{1}{8} \right)$$

Find the x- and y-intercepts. Then graph the equation.

12) $8y - 2x = -4$



x	y
2	0
0	-1/2

$$\begin{array}{l} 8(0) - 2x = -4 \\ 0 - 2x = -4 \\ -2x = -4 \\ \frac{-2x}{-2} = \frac{-4}{-2} \\ x = 2 \end{array}$$

$$\begin{array}{l} 8y - 2(0) = -4 \\ 8y - 0 = -4 \\ 8y = -4 \\ \frac{8y}{8} = \frac{-4}{8} \\ y = -\frac{1}{2} \end{array}$$

$$\begin{array}{l} \text{X-INT} = (2, 0) \\ \text{Y-INT} = (0, -\frac{1}{2}) \end{array}$$

Find the midpoint of the segment with the given endpoints.

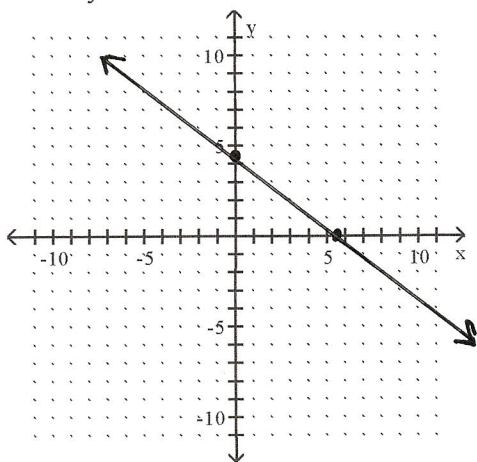
13) $(-7, -3)$ and $(6, 6)$

$$\begin{aligned} \text{MID POINT} &= \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \\ &= \left(\frac{-7 + 6}{2}, \frac{-3 + 6}{2} \right) \\ &= \left(\frac{-1}{2}, \frac{3}{2} \right) \end{aligned}$$

$$\boxed{\left(-\frac{1}{2}, \frac{3}{2} \right)}$$

Find the slope of the line and sketch the graph.

14) $4x + 5y = 22$



$$Ax + By = C$$

$$A = 4$$

$$B = 5$$

$$C = 22$$

$$\text{SLOPE} = -\frac{A}{B}$$

$$= \boxed{-\frac{4}{5}}$$

$$y\text{-INT} = \left(0, \frac{C}{B} \right)$$

$$= \left(0, \frac{22}{5} \right)$$

$$x\text{-INT} = \left(\frac{C}{A}, 0 \right)$$

$$= \left(\frac{22}{4}, 0 \right)$$

Decide whether the pair of lines is parallel, perpendicular, or neither.

15) $3x - 8y = 8$ and $32x + 12y = 2$

$$A_1 = 3$$

$$B_1 = -8$$

$$C_1 = 8$$

$$A_2 = 32$$

$$B_2 = 12$$

$$C_2 = 2$$

$$\text{SLOPE}_1 = -\frac{A}{B}$$

$$\text{SLOPE}_1 = -\frac{3}{-8} = \frac{3}{8}$$

$$\text{SLOPE}_2 = -\frac{32}{12}$$

$$= -\frac{8}{3}$$

$$\text{SLOPE}_1 * \text{SLOPE}_2 = \left(\frac{3}{8} \right) * \left(-\frac{8}{3} \right) = -1$$

SO **LINES ARE PERPENDICULAR**

