

Name SOLUTIONS

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.

$$1) 5(y + 7) = 6(y - 7)$$

$$\begin{array}{r} 5y + 35 = 6y - 42 \\ -35 \quad \quad -35 \\ \hline \end{array}$$

$$\begin{array}{r} 5y \quad = 6y - 77 \\ -6y \quad -6y \\ \hline \end{array}$$

$$-1y = -77$$

$$\boxed{y = 77}$$

$$2) \frac{a}{5} - \frac{1}{5} = -6$$

$$\frac{A-1}{5} = -6$$

$$A-1 = -30$$

$$\boxed{A = -29}$$

Solve the formula for the specified variable.

$$3) A = \frac{1}{2}h(b_1 + b_2) \text{ for } b_1$$

$$2A = h(b_1 + b_2)$$

$$\frac{2A}{h} = b_1 + b_2$$

$$\boxed{b_1 = \frac{2A}{h} - b_2 \quad \text{OR} \quad b_1 = \frac{2A - hb_2}{h}}$$

- (a) Use the variable x for the unknown, and write an equation representing the verbal sentence.
 (b) Then solve the problem.

4) When 2 times a number is subtracted from 7 times the number, the result is 50.

LET x BE THE NUMBER

$$a) \quad 7x - 2x = 50$$

$$5x = 50$$

$$b) \quad x = 10$$

Solve the problem.

5) In a recent school board election, the two candidates for president received 1159 votes. The loser received 567 fewer votes than the winner. How many votes did the winner receive?

LET $x = \#$ OF WINNING VOTES

$x - 567 = \#$ OF LOSING VOTES

$x + (x - 567) = 1159$ TOTAL VOTES

$$2x - 567 = 1159$$

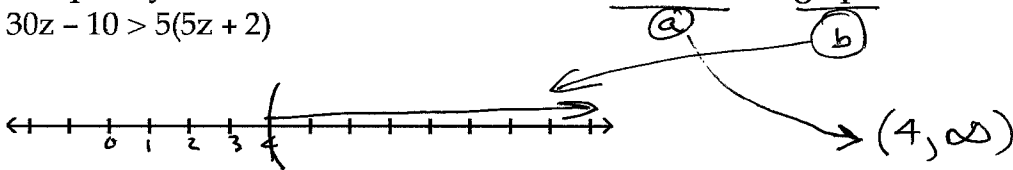
$$2x = 1726$$

$$x = 863$$

WINNER GOT 863 VOTES

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

6) $30z - 10 > 5(5z + 2)$



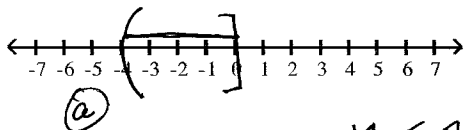
$$30z - 10 > 25z + 10$$

$$5z - 10 > 10$$

$$5z > 20$$

$$z > 4$$

7) $-14 < 4z + 2 \leq 2$



$$-14 < 4z + 2 \leq 2$$

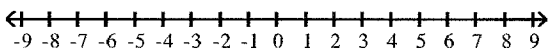
$$-16 < 4z \leq 0$$

$$-4 < z \leq 0$$

(b) $(-4, 0]$

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

8) $5x - 1 < 4$ and $x - 2 > -1$



$$5x - 1 < 4$$

$$5x < 5$$

$$x < 1$$

$$x - 2 > -1$$

$$x > 1$$

NO NUMBER IS BOTH LESS THAN 1 AND GREATER THAN 1!

THE ANSWER IS THE NULL SET



Solve the equation.

9) $\left| 8 + \frac{1}{3}x \right| = 5$

$$8 + \frac{1}{3}x = 5$$

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

$$x = -9$$

$$8 + \frac{1}{3}x = -5$$

$$\frac{x}{3} = -13$$

$$x = -39$$

$\{-39, -9\}$

↑ SMALLEST SHOWN FIRST

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.

10) $|h+2| + 8 \leq 11$

$$|h+2| \leq 3$$

$$h+2 \leq 3$$

$$h \leq 1$$

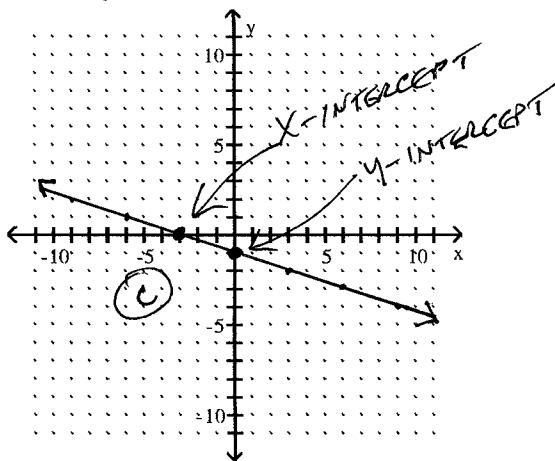
$$h+2 \geq -3$$

$$h \geq -5$$

$$\boxed{[-5, 1]}$$

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

11) $-3x - 9y = 9$



WHEN $x=0$ $-9y=9$

$$y = -1$$

(b) y -INTERCEPT IS $(0, -1)$

WHEN $y=0$ $-3x=9$

$$x = -3$$

(a) x -INTERCEPT IS $(-3, 0)$

Find the midpoint of the segment with the given endpoints.

12) $(-9, -8)$ and $(9, 9)$

$$\left(\frac{-9+9}{2}, \frac{-8+9}{2} \right)$$

$$\left(\frac{0}{2}, \frac{1}{2} \right)$$

$$\boxed{\left(0, \frac{1}{2} \right)}$$

Find the slope of the line through the pair of points.

13) $(-5, -2)$ and $(-8, -7)$

#1

$$\frac{-7 - (-2)}{-8 - (-5)}$$

$$\frac{-7 + 2}{-8 + 5}$$

$$\frac{-5}{-3}$$

$$\boxed{\frac{5}{3}}$$

$$M = \frac{y_2 - y_1}{x_2 - x_1}$$

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

14) $3x - 4y = -10$ and $8x + 6y = 7$

$$-4y = -3x - 10$$

$$y = \frac{-3}{-4}x - \frac{10}{-4}$$

$$y = \frac{3}{4}x + \frac{5}{2}$$

SLOPE OF THIS
LINE IS $\frac{3}{4}$

$$6y = -8x + 7$$

$$y = \frac{-8}{6}x + \frac{7}{6}$$

$$y = -\frac{4}{3}x + \frac{7}{6}$$

SLOPE OF THIS
LINE IS $-\frac{4}{3}$

$$\left(\frac{3}{4}\right)\left(-\frac{4}{3}\right) = -1$$

SO LINES ARE
PERPENDICULAR

Find an equation of the line that satisfies the conditions. Write the equation in standard form.

15) Through $(0, 5)$; $m = \frac{4}{5}$

$$y = mx + b \quad b \text{ is } y\text{-INTERCEPT VALUE} = 5$$

$$\boxed{y = \frac{4}{5}x + 5} = \text{SLOPE INTERCEPT FORM}$$

$$5y = 4x + 25$$

$$4x = 5y - 25$$

$$\boxed{4x - 5y = -25} = \text{STANDARD FORM}$$

Find an equation of the line satisfying the conditions. Write the equation in slope-intercept form.

16) Through $(-6, 7)$; parallel to $3x + 7y = 3$

$$3x + 7y = 3$$

$$7y = -3x + 3$$

$$y = -\frac{3}{7}x + \frac{3}{7}$$

$$\text{SLOPE IS } -\frac{3}{7}$$

NEW LINE WILL HAVE THE SAME SLOPE.

$$m = \frac{y - y_1}{x - x_1} \quad -\frac{3}{7} = \frac{y - 7}{x - (-6)}$$

$$-\frac{3}{7} = \frac{y - 7}{x + 6}$$

$$-\frac{3}{7}(x + 6) = y - 7$$

$$-\frac{3}{7}x - \frac{18}{7} = y - 7$$

$$-\frac{3}{7}x - \frac{18}{7} + 7 = y$$

$$\rightarrow y = -\frac{3}{7}x - \frac{18}{7} + \frac{49}{7}$$

$$y = -\frac{3}{7}x + \frac{31}{7}$$

Solve the problem.

17) Find $f(-2)$ when $f(x) = 2x^2 - 3x - 7$.

$$f(-2) = 2(-2)^2 - 3(-2) - 7$$

$$= 2 \cdot 4 + 6 - 7$$

$$= 8 + 6 - 7$$

$$f(-2) = 7$$

An equation that defines y as a function of x is given. Solve for y in terms of x , and replace y with the function notation $f(x)$.

18) $5x - 6y = 5$

$$-6y = -5x + 5$$

$$y = \frac{-5}{-6}x + \frac{5}{-6}$$

$$y = \frac{5}{6}x - \frac{5}{6}$$

$$f(x) = \frac{5}{6}x - \frac{5}{6}$$

↑

BEST ANSWER

$$\text{OR } \frac{5x - 5}{6}$$

$$\text{OR } \frac{5 - 5x}{-6}$$