

Linear Equations and Inequalities-Review for Retake

Solve each equation. absolute value: set up 2 equations

1)  $|-a-9| - 1 = 8$

2)  $-8|2n+5| = -120$

$\{-18, 0\}$   
 $|-a-9| = 9$   
 $-a-9=9$      $-a-9=-9$   
 $-a=18$      $-a=0$   
 $a=-18$      $a=0$

$\{5, -10\}$   
 $|2n+5| = 15$   
 $2n+5 = 15$      $2n+5 = -15$   
 $2n=10$      $2n=-20$   
 $n=5$      $n=-10$

3)  $|10n-2| + 7 = 59$

4)  $|5+5x| - 8 = -38$

$\{\frac{27}{5}, -5\}$   
 $|10n-2| = 52$   
 $10n-2 = 52$      $10n-2 = -52$   
 $10n = 54$      $10n = -50$   
 $n = \frac{54}{10} = 5.4$      $n = -5$

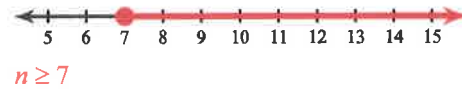
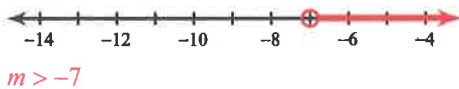
No solution.

$|5+5x| = -30$   
 $\emptyset$  absolute value cannot = negative

Solve each inequality and graph its solution.

5)  $5(3-2m) < 85$

6)  $-3(2-6n) \geq 120$

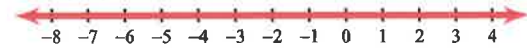


$m > -7$   
 $15 - 10m < 85$   
 $-10m < 70$   
 $m > -7$      $(-7, \infty)$

$n \geq 7$   
 $-6 + 18n \geq 120$   
 $18n \geq 126$   
 $n \geq 7$      $[7, \infty)$

7)  $-8(1+8a) > -328$

8)  $9\left|\frac{n}{3}\right| \geq -6$



$a < 5$   
 $-8 - 64a > -328$   
 $-64a > -320$   
 $a < 5$      $(-\infty, 5)$

{ All real numbers. }  
 $\left|\frac{n}{3}\right| \geq -54$      $(-\infty, \infty)$   
 absolute value always positive so always > negative.

9)  $|p+6| - 9 < 4$

10)  $-10|x-1| \leq -10$

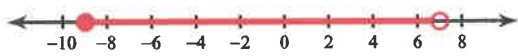


$-19 < p < 7$   
 $|p+6| < 13$   
 $p+6 < 13$  and  $p+6 > -13$   
 $p < 7$  and  $p > -19$   
 $(-19, 7)$

$x \geq 2$  or  $x \leq 0$   
 $|x-1| \geq 1$   
 $x-1 \geq 1$      $x-1 \leq -1$   
 $x \geq 2$  or  $x \leq 0$   
 $(-\infty, 0] \cup [2, \infty)$

Solve each compound inequality and graph its solution.

11)  $-69 \leq 8x + 3 < 59$



$-9 \leq x < 7$

$$\begin{array}{r} -69 \leq 8x + 3 < 59 \\ -3 \quad \quad -3 \quad -3 \end{array}$$

$$-72 \leq 8x < 56$$

$$-9 \leq x < 7$$

$$[-9, 7)$$

12)  $10 + 6r \geq 64$  or  $2r + 2 < 2$



$r \geq 9$  or  $r < 0$

$$10 + 6r \geq 64$$

$$6r \geq 54$$

$$r \geq 9$$

$$(-\infty, 0) \cup [9, \infty)$$

$$2r + 2 < 2$$

$$2r < 0$$

$$\text{OR } r < 0$$

13)  $10 - 2r > 26$  or  $10r - 4 > 36$



$r < -8$  or  $r > 4$

$$10 - 2r > 26$$

$$-2r > 16$$

$$r < -8 \text{ OR } r > 4$$

$$(-\infty, -8) \cup (4, \infty)$$

$$10r - 4 > 36$$

$$10r > 40$$

14)  $-26 < -5x - 1 < 44$



$-9 < x < 5$

$$-26 < -5x - 1 < 44$$

$$+1 \quad \quad +1 \quad +1$$

$$-25 < -5x < 45$$

$$5 > x > -9$$

$$-9 < x < 5 \quad (-9, 5)$$

Sketch the graph of each line.

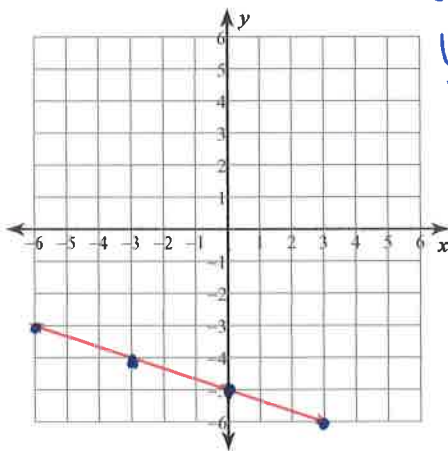
15)  $x + 3y = -15$

$$3y = -x - 15$$

$$y = -\frac{1}{3}x - 5$$

↑ m

↑ b



16)  $5x - y = -5$

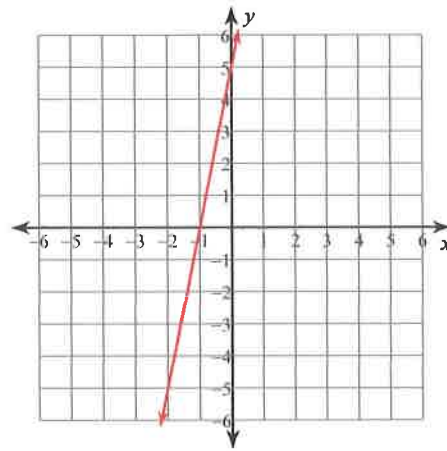
$$-y = -5x - 5$$

$$y = 5x + 5$$

↑ m

↓ 5/1

↑ b



Write the slope-intercept form of the equation of the line through the given point with the given slope.

17) through:  $(5, 2)$ , slope  $= \frac{3}{5}$

$$y = \frac{3}{5}x - 1$$

$$a = \frac{3}{5}(5) + b$$

$$a = 3 + b$$

$$-1 = b$$

18) through:  $(3, -4)$ , slope  $= -2$

$$y = -2x + 2$$

$$-4 = -2(3) + b$$

$$-4 = -6 + b$$

$$2 = b$$

Write the slope-intercept form of the equation of the line through the given points.

19) through:  $(-3, -1)$  and  $(4, 2)$

$$y = \frac{3}{7}x + \frac{2}{7}$$

$$m = \frac{2 - (-1)}{4 - (-3)} = \frac{3}{7}$$

$$a = \frac{3}{7}(4) + b$$

$$2 = \frac{12}{7} + b$$

$$b = \frac{2}{7}$$

20) through:  $(-3, -3)$  and  $(0, 3)$

$$y = 2x + 3$$

$$m = \frac{3 + 3}{0 + 3} = \frac{6}{3} = 2$$

$$b = 3$$

Write the slope-intercept form of the equation of the line described.

21) through:  $(-3, 2)$ , parallel to  $y = -\frac{5}{3}x - 1$

$$y = -\frac{5}{3}x - 3$$

$$\parallel m = -\frac{5}{3}$$

$$2 = -\frac{5}{3}(-3) + b$$

$$2 = 5 + b$$

$$b = -3$$

22) through:  $(1, 4)$ , parallel to  $y = 3x - 5$

$$y = 3x + 1$$

$$\parallel m = 3$$

$$4 = 3(1) + b$$

$$1 = b$$

23) through:  $(3, -1)$ , perp. to  $y = 2x - 2$

$$y = -\frac{1}{2}x + \frac{1}{2}$$

$$\perp m = -\frac{1}{2}$$

$$-1 = -\frac{1}{2}(3) + b$$

$$-1 = -\frac{3}{2} + b$$

$$\frac{1}{2} = b$$

24) through:  $(-4, -5)$ , perp. to  $y = -\frac{4}{5}x - 5$

$$y = \frac{5}{4}x$$

$$\perp m = \frac{5}{4}$$

$$-5 = \frac{5}{4}(-4) + b$$

$$-5 = 5 + b$$

$$0 = b$$