Algebra 2 – Chapter 2 Review

Name: _____Key_____ Hour: _____

Find the slope of the line crossing through the two points.

$\dfrac{y_2-y_1}{x_2-x_1}$

$x_1\ y_1,\ x_2\ y_2$

1. $(8,-4)$ & $(3,5)$

$\dfrac{5-(-4)}{3-8} = \boxed{\dfrac{9}{-5}}$

2. $(4,-15)$ & $(-6,-11)$

$\dfrac{-11-(-15)}{-6-4} = \dfrac{4}{-10} = \boxed{-\dfrac{2}{5}}$

3. $(12,7)$ & $(12,-3)$

$\dfrac{-3-7}{12-12} = \dfrac{-4}{0}$, undef.

Find the equation of the line in slope-intercept form. Then convert the equation to standard form.

4. Slope $= 2$; $y-int = (0,3)$ $b=3$

$y = mx+b$

$\boxed{y = 2x+3}$
$-2x \quad -2x$

Standard Form: $-2x+y=3$

★ 5. Slope $= 3$; & passes through $(-1,7)$

$7 = 3(-1)+b$

$7 = -3+b$ $\boxed{y=3x+10}$

$b=10$

Standard Form: $-3x+y=10$

6. Passes through $(-3,8)$ & $(6,5)$

$m = \dfrac{5-8}{6-(-3)} = \dfrac{-3}{9}$

$y = mx+b$

$\boxed{y = -\dfrac{3}{9}x+7}$

$y = mx+b$

$5 = -\dfrac{3}{9}(6)+b$

$5 = -2+b$

$b=7$

Standard Form: $\dfrac{3}{9}x+y=7$

7. $m = -\dfrac{1}{4}$; $b = 6.3$

$y = -\dfrac{1}{4}x+6.3$

Standard Form: $\dfrac{1}{4}x+y=6.3$

8. Find the equation of the line that is parallel to $x-2y=8$ and passes through $(4,-3)$.

Slope: $\dfrac{1}{2}$

$\left.\begin{array}{l} x-2y=8 \\ -x \qquad -x \end{array}\right\}$ $\dfrac{-2y}{-2} = \dfrac{-x}{-2}+\dfrac{8}{-2}$ $\Big\}$ $y=\dfrac{1}{2}x-4$

$y = mx+b$

$-3 = \dfrac{1}{2}(4)+b$

$-3 = 2+b$

$-5=b$

$y = mx+b$

$\boxed{y=\dfrac{1}{2}x-5}$

9. Find the Equation of the line that passes through $(-4,-1)$ and is perpendicular to the line passing through $(-15,7)$ & $(-3,3)$.

$\dfrac{3-7}{-3-(-15)} = \dfrac{-4}{12} = -\dfrac{1}{3}$: opp. recip. $m = \dfrac{3}{1} = 3$

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

$-1 = -12+b$ $\boxed{y=3x+11}$

$11 = b$

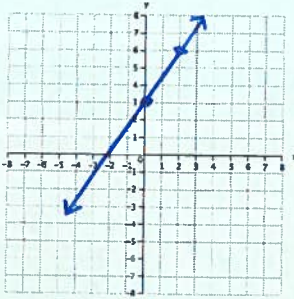10. Find the equation of the line that passes through $(4,5)$ and is perpendicular to $x+6y=-3$.

$5 = 6(4)+b$

$5 = 24+b$ $\boxed{y=6x-19}$

$-19 = b$

$m=6$

$x+6y=-3$

$6y=-x-3$

$y=-\dfrac{1}{6}x-\dfrac{1}{2}$

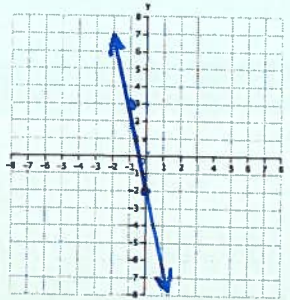11. Find the equation of the line that passes through the x-intercept of $2x-3y=6$ and is perpendicular to $x+6y=-3$.

$m=6$

$6y=-x-3$

$y=-\dfrac{1}{6}x-\dfrac{1}{2}$

$0=3(6)+b$

$b=-18$

$\boxed{y=6x-18}$

$2x-3(0)=6$

$2x=6$

$x=3$

$(3,0)$
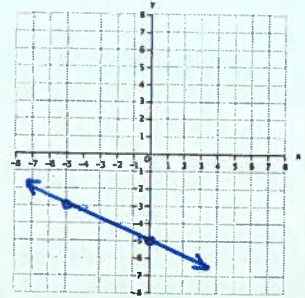
Graph the following equations.
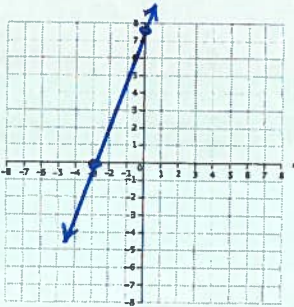
12. $y = \frac{3}{2}x + 3$
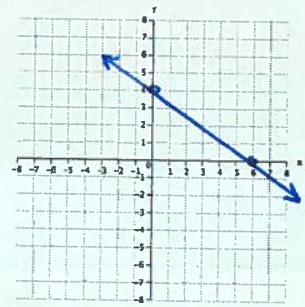
13. $y = -5x - 2$

14. $-\frac{2}{5}x - 5$

15. $5x - 2y = -15$

x-int :
$5x = -15$
$x = -3$
$(-3, 0)$
y-int :
$-2y = -15$
$y = \frac{15}{2}$
$(0, \frac{15}{2})$

x-int :
$2x = 12$
$x = 6$
$(6, 0)$
y-int :
$3y = 12$
$y = 4$
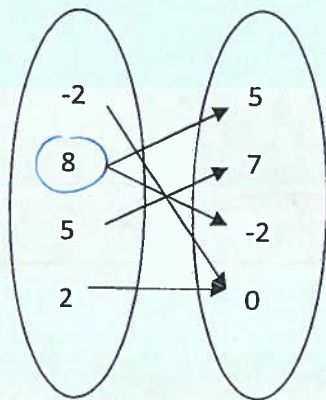$(0, 4)$

16. $2x + 3y = 12$

State whether the following relations are functions.

17. $\{(3, -5), (8, 1), (-3, -3), (5, 1)\}$ Is a function

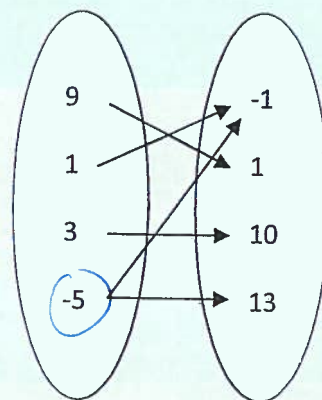18. $\{(9, -2), (0, 0), (7, 4), (9, 3)\}$ is not a function

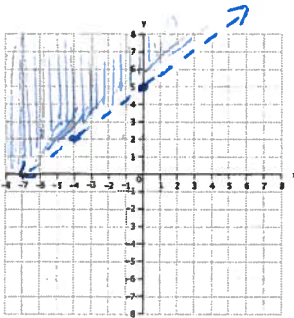19. $\{(6, 2), (4, -1), (-1, 8), (4, 1)\}$ Not a function

20.

-2	5
8	7
5	-2
2	0

NOT a Function

21.

9	-1
1	1
3	10
-5	13

Not a function

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Graph the following linear inequalities.

22. $3x - 4y > 20$

· Steps   solve for y.
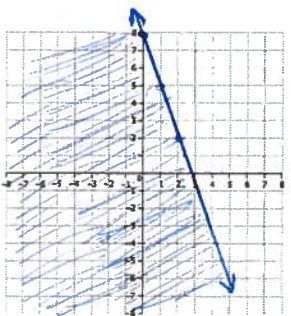· Graph like a line
· use solid/dashed line
· test a point
· shade

$3x - 4y > 20$
$-3x \qquad -3x$
$-4y > -3x + 20$
$\overline{-4} \qquad \overline{-4} \qquad \overline{-4}$
$y < \frac{3}{4}x - 5$
$0 < -5$?

23. $y < -\frac{1}{2}x - 3$

$0 < -3$

24. $y \le -3x + 8$

$0 \le 8$? ✓

$8x + 4y \ge -20$
$-8x \qquad\qquad -8x$
$\frac{4y}{4} \ge \frac{-8x}{4} \frac{-20}{4}$
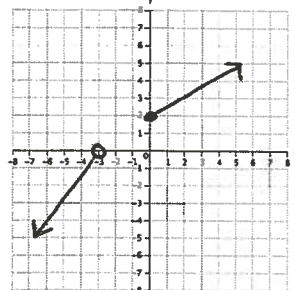$y \ge -2x - 5$
$0 \ge -5$

25. $8x + 4y \ge -20$

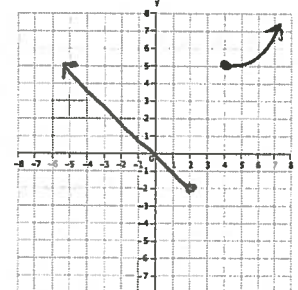**State the domain and range of the following graphs.**

26.

D: $(-\infty, \infty)$

R: $[0, \infty)$

27.

D: $(-\infty, -3) \cup [0, \infty)$
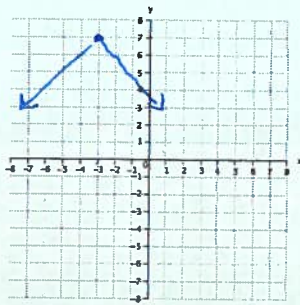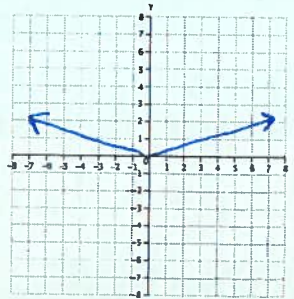
R: $(-\infty, 0) \cup [2, \infty)$

28.

D: $(-\infty, 2] \cup [4, \infty)$

R: $[-2, \infty)$

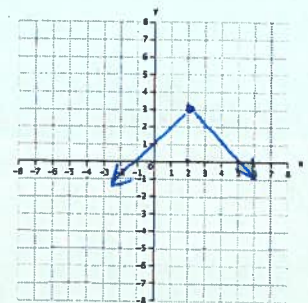## Graph the following Absolute value equations.

29. $y = -|x + 3| + 7$

30. $y = \frac{1}{3}|x|$

31. $y = -|x - 2| + 3$

State the transformation of the following absolute value functions from the parent function $y = |x|$.

32. $y = -|x + 1|$ Left 1

33. $f(x) = 3\left|x - \frac{1}{2}\right| + 6$ Right $\frac{1}{2}$, up 6, narrowed by 3

34. $k(x) = -0.5|x| - 7.15$ Reflected over x-axis, widened by $\frac{1}{2}$, down 7.15

Solve the following problems for x.

35. $-7 < 8 + \frac{5}{6}x$

$-8 \quad -8$

$\frac{6}{5} \cdot \quad -15 < \frac{5}{6}x \quad \cdot \frac{6}{5}$

$\boxed{-18 < x}$

36. $10 - \frac{3}{4}x < -8$

$-\frac{4}{3} \cdot \quad -\frac{3}{4}x < -18 \cdot -\frac{4}{3}$

$\boxed{x > 24}$

37. $2x - 5 = -17$

$+5 \quad +5$

$\frac{2x}{2} = \frac{-12}{2}$

$\boxed{x = -6}$

Isolate Abs. Value
Separate
Solve each.

38. $-\frac{1}{2}x + 5 = 14$

$-2 \cdot \quad -\frac{1}{2}x = 9 \cdot -2$

$\boxed{x = -18}$

39. $\left|\frac{1}{2}x + 3\right| = 9$

$\frac{1}{2}x + 3 = 9 \quad\Big\}\quad \frac{1}{2}x + 3 = -9$

$\frac{1}{2}x = 6 \qquad\qquad \frac{1}{2}x = -12$

$\boxed{x = 12} \qquad\qquad \boxed{x = -24}$

Never
distribute

40. $2|6x - 11| + 2 = 82$

$-2 \quad -2$

$\frac{2|6x - 11|}{2} = \frac{80}{2}$

$|6x - 11| = 40$

$6x - 11 = 40 \qquad\qquad 6x - 11 = -40$

$6x = 51 \qquad\qquad 6x = -29$

$\boxed{x = \frac{51}{6}} \qquad\qquad \boxed{x = \frac{-29}{6}}$