Algebra 2 Worksheet **Name:** Key

Hodge-Podge Sections 2.3-2.5 **Period:** _____

I. Determine whether or not each data set could represent a linear function. EXPLAIN your answer.

1.

x	-3	-2	-1	0
$f(x)$	5	7	9	11

+1 +1 +1

+2 +2 +2

$\frac{2}{1}$ $\frac{2}{1}$ $\frac{2}{1}$

linear b/c constant rate of change

2.

x	100	150	200	250	300
$f(x)$	7	10	15	22	31

+50 +50 +50 +50

+3 +5 +7 +9

$\frac{3}{50}$ $\frac{5}{50}$ $\frac{7}{50}$ $\frac{9}{50}$

NOT linear b/c rate of change is NOT constant

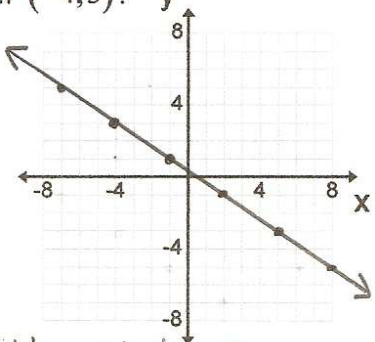
II. Graphing.

3. Graph the line with a slope of $-\frac{2}{3}$ and that passes through the point $(-4,3)$.

$-\frac{2}{3} \Rightarrow \frac{-2}{3}$ or $\frac{2}{-3}$

$\frac{-2 \text{ rise}}{+3 \text{ run}}$

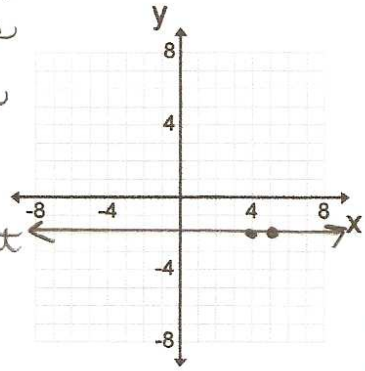
so, down 2, to the right 3



4. Graph the line with a slope of 0 and that passes through the point $(4,-2)$.

$0 \Rightarrow \frac{0 \text{ rise}}{1 \text{ run}}$

so, up 0, to the right 1

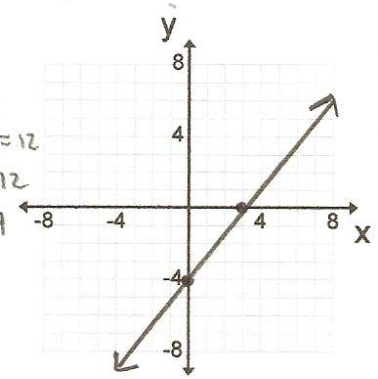


5. Find the x and y intercepts of the line $4x-3y=12$. Then graph the line.

x-int:
$4x-3(0)=12$
$4x=12$
$x=3$

y-int:
$4(0)-3y=12$
$-3y=12$
$y=-4$

x-intercept: $(3,0)$
y-intercept: $(0,-4)$

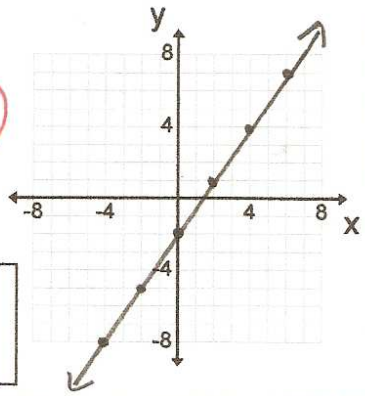


6. Write the line $3x-2y=4$ in slope-intercept form. Then graph the line.

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

$y=\frac{3}{2}x-2$

Slope-intercept Form: $y=\frac{3}{2}x-2$



III. Parallel/Perpendicular

7. Given a line that passes through the points $(-2,3)$ and $(-4,10)$, find...

x y

(a) the slope the this line $\frac{10-3}{-4+2}=\frac{7}{-2}$ (a) $-\frac{7}{2}$

(b) the slope of the line PARALLEL to this line (b) $-\frac{7}{2}$

same slope

(c) the slope of the line PERPENDICULAR to this line (c) $+\frac{2}{7}$

opposite reciprocal slope

IV. Write the equation of each line described in the form requested.

8. passing through $(2,-1)$ with a slope of -3 in **slope-intercept form**

x_1 y_1 m

$y - y_1 = m(x - x_1)$

$y - -1 = -3(x-2)$

$y + 1 = -3x + 6$

$y = -3x + 5$

Equation of the Line: $y = -3x + 5$

9. passing through $(3,-2)$ and $(4,0)$ in **standard form**

x y

(4, 0)

$m = \frac{0 + 2}{4 - 3}$

$m = 2$

pick a point (4,0)

$y - y_1 = m(x - x_1)$

$y - 0 = 2(x - 4)$

$y = 2x - 8$

$-2x + y = -8$

$2x - y = 8$

Equation of the Line: $2x - y = 8$

10. parallel to the line $y = \frac{2}{3}x + 4$ and passing through the point $(6,-1)$ in **standard form**

$m = \frac{2}{3}$

x_1 y_1

same slope

so $m_{\parallel} = \frac{2}{3}$

parallel

$y - y_1 = m(x - x_1)$

$y + +1 = \frac{2}{3}(x - 6)$

$y + 1 = \frac{2}{3}x - 4$

$y = \frac{2}{3}x - 5$

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

$-2x + 3y = -15$

$2x - 3y = 15$

Equation of the Line: $2x - 3y = 15$

11. perpendicular to the line $x + 2y = -6$ and passing through the point $(-4,2)$ in **slope-intercept form**

x_1 y_1

$\frac{2y}{2} = \frac{-x - 6}{2}$

$y = -\frac{1}{2}x - 3$

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

opposite reciprocal slope

so $m_{\perp} = +2$

$y - y_1 = m(x - x_1)$

$y - 2 = 2(x + +4)$

$y - 2 = 2x + 8$

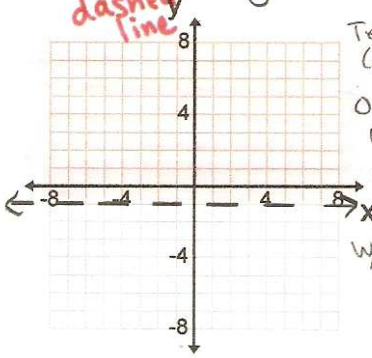
$y = 2x + 10$

Equation of the Line: $y = 2x + 10$

V. Graph each inequality.

12. $y > -1$ → $y > 0x - 1$

dashed line



Test (0,0)

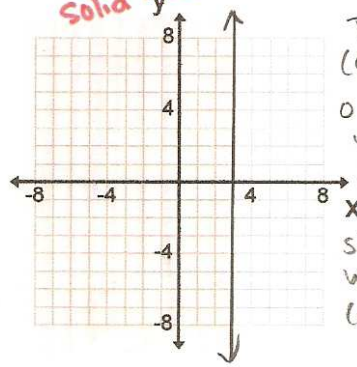
$0 > -1$

yes!

Shade on side w/ (0,0)

13. $x \le 3$ vertical line!

solid line



Test (0,0)

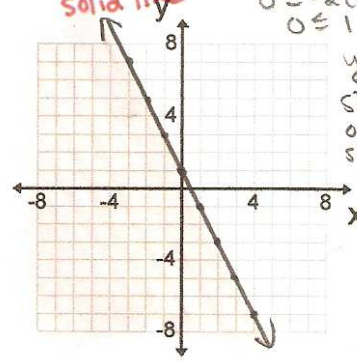
$0 \le 3$

yes!

Shade on side w/ (0,0)

14. $y \le -2x + 1$

solid line



Test (0,0)

$0 \le -2(0) + 1$

$0 \le 1$

yes!

Shade on side w/ (0,0)

VI. Find the x and y intercepts and then graph.

15. $x + 2y < -2$

Test (0,0)

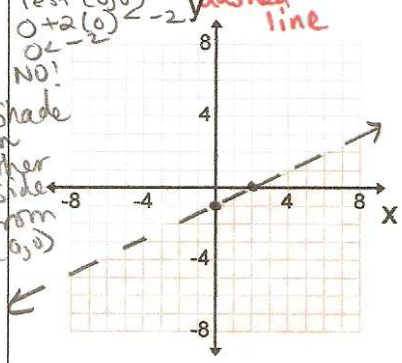
$0 + 2(0) < -2$

$0 < -2$

NO!

Shade on other side from (0,0)

dashed line



$x + 2(0) = -2$

$x = -2$

$0 + 2y = -2$

$2y = -2$

$y = -1$

x-intercept: $(-2,0)$

y-intercept: $(0,-1)$

16. $2x - 3y \le 6$

Test (0,0):

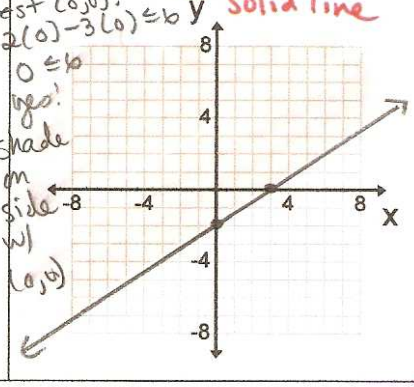
$2(0) - 3(0) \le 6$

$0 \le 6$

yes!

Shade on side w/ (0,0)

solid line



$2x - 3(0) = 6$

$2x = 6$

$x = 3$

$2(0) - 3y = 6$

$-3y = 6$

$y = -2$

x-intercept: $(3,0)$

y-intercept: $(0,-2)$