Lessons 2.8 Worksheet

Name: Key

1.) Explain the difference(s) between the graph of a linear inequality in two variables and the graph of a linear equation in two variables.

- A linear inequality graph may have a solid or dashed line, while the equation will always be a solid line.
- A linear inequality graph will include a shaded portion of the graph which represents All of the solutions to the inequality.

Tell whether the given ordered pairs are solutions of the inequality.

2.) $x - y < 4$; $(5, 4), (-1, -4)$

$5 - 4 \overset{?}{<} 4$; $-1 - -4 \overset{?}{<} 4$

$1 < 4$ ✓ ; $3 < 4$ ✓

$(5, 4)$? yes

$(-1, -4)$? yes

3.) $2x + 3y \leq -3$; $(0, -1), (-3, 2)$

$2(0) + 3(-1) \overset{?}{\leq} -3$; $2(-3) + 3(2) \overset{?}{\leq} -3$

$-3 \leq -3$ ✓ ; $-6 + 6 \overset{?}{\leq} 3$

$0 \leq -3$ ✗

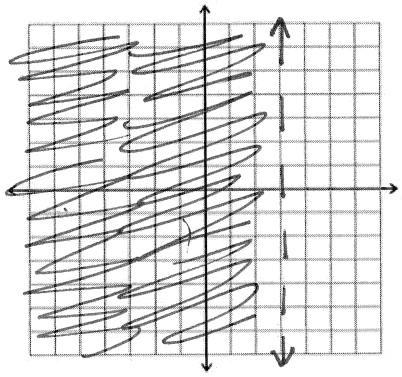
$(0, -1)$? yes

$(-3, 2)$? no

Graph the following inequalities. Be sure to display the information you obtain to help you complete the graph (t-table, slope and y-intercept and/or the x- and y-intercepts)!

4.) $x < 3$

x	y



5.) $y \leq \frac{3}{4}x + 1$

slope: $\frac{3}{4}$

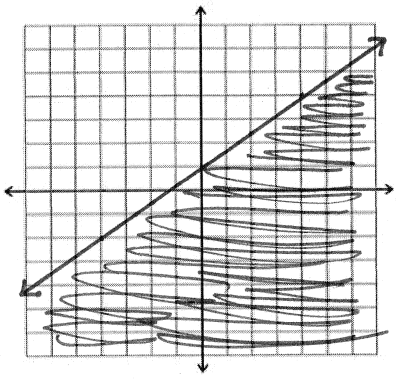
y-int: $(0, 1)$

x	y

Test $(0, 0)$

$0 \leq \frac{3}{4}(0) + 1$

$0 \leq 1$ ✓ Shade with

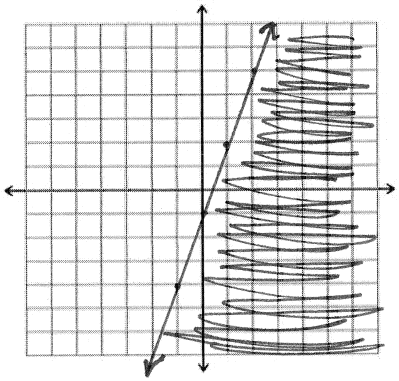


6.) $3x - y \geq 1$

$-y = -3x + 1$

$y = 3x - 1$

x	y



$m =$ 3

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

Test $(0, 0)$

$3(0) - 0 \geq 1$

$0 \geq 1$ ✗

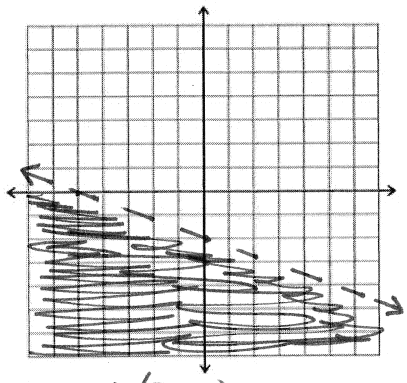
Shade away!

7.) $2x + 5y < -10$

x	y

x-int: $(-5, 0)$

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



Test $(0, 0)$

$2(0) + 5(0) < -10$

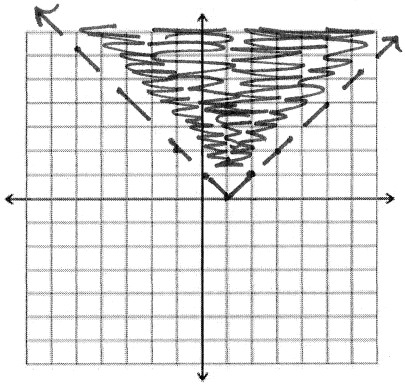
$0 < -10$ ✗

Shade Away!

8.) $y > |x-1|$

vertex: (1, 0)
opens: up

x	y
-1	2
0	1
1	0
2	1
3	2



Test (0,0)

$0 > |0-1|$

$0 > 1$ x false shade away!

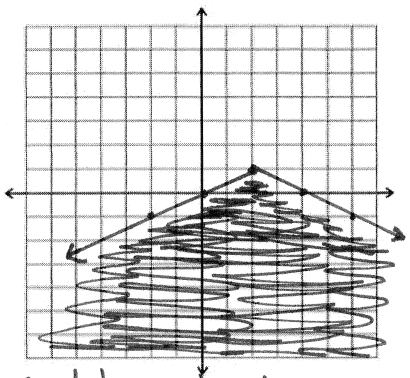
9.) $y \leq -\frac{1}{2}|x-2|+1$

vertex: (2, 1)
opens: down

-2 -1

x	y
0	0
1	
2	1
3	
4	0

6 1



Test (0,1)

$1 \leq -\frac{1}{2}|0-2|+1$

$1 \leq 0$ false shade away

10.) On a two week vacation, you and your brother can rent one canoe for \$11 per day or rent two mountain bikes for \$13 per day. Together, you have \$120 to spend.

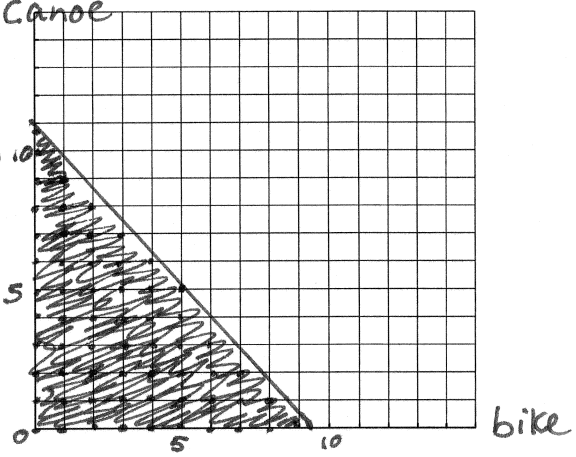
a) Write and graph an inequality describing the possible number of days you and your brother can canoe or bicycle together. Make sure you label your graph!

c = # of days renting a canoe

b = # of days renting bikes

$11c + 13b \leq 120$

c-int: (0, 10.9) b-int: (9.2, 0)



b) Give three possible solutions of the inequality you created.

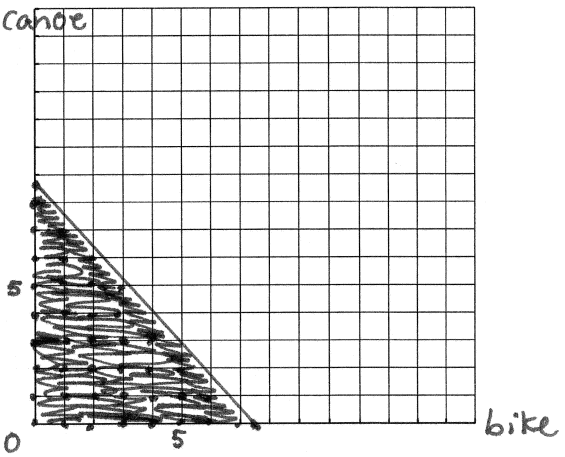
many possible combos: bike 2 days, canoe 5
bike 5 days, canoe 4
bike 8 days, canoe 1
bike 4, canoe 4
bike 1, canoe 5 bike 3, canoe 6

c) You decide that on one day you will canoe alone and your brother will bike alone. Repeat parts a) and b) for this new situation.

This means that you would have to pay for a canoe and bikes on the same day. This costs \$24. You now have \$96 total to spend

$11c + 13b \leq 96$

c-int: (0, 8.7)
b-int: (7.4, 0)



11.) Write the equation of the lines in both standard form and slope-intercept form.

a) Passing through $(3, -4)$ and $(-2, 5)$

$m = \frac{5+4}{-2-3} = \frac{9}{-5}$

$y+4 = -\frac{9}{5}(x-3)$

$y+4 = -\frac{9}{5}x + \frac{27}{5}$

$-\frac{9}{5}x + y = \frac{7}{5}$

$y = -\frac{9}{5}x + \frac{7}{5}$ $-9x + 5y = 7$

b) Perpendicular to $x - 5y = 7$ and passing through $(4, 4)$

$m = -5$

$y = -5x + 24$ $5x + y = 24$

$y - 4 = -5(x-4)$

$y - 4 = -5x + 20$

c.) Parallel to $y = -\frac{2}{3}x + 8$ and passing through the origin.

$\frac{2}{3}x + y = 0$

$y = -\frac{2}{3}x$ $2x + 3y = 0$