

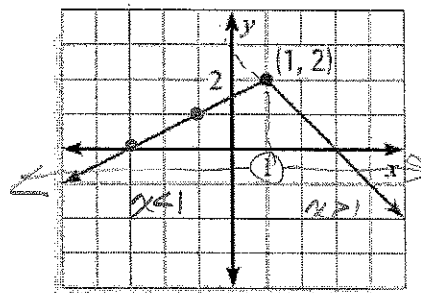
Name \_\_\_\_\_

KEY

Algebra II  
Chapter 2 Test Review - Calculator OK

- 1) Write the piecewise function of the graph.

$$f(x) = \begin{cases} \frac{1}{2}x + \frac{3}{2}, & x \leq 1 \\ -x + 3, & x > 1 \end{cases}$$



- 2) While building his time machine, Prof. Weinstein found that the number of widgets (
- $w$
- ) varied directly with the number of henways (
- $h$
- ) in the flux capacitor. If there are 3 widgets and 18 henways, find the constant of variation and the function rule.

$$y = kx \Rightarrow w = (k)h$$

$$3 = k \cdot 18$$

$$\frac{3}{18} = k \quad \text{or} \quad k = \frac{1}{6}$$

2)  $k = \frac{1}{6}$

$$w = \frac{1}{6}h$$

$$6w = h$$

- 3) Find the vertex:
- $g(x) = 3|5x - 3| - 7$

$$5x - 3 = 0$$

$$5x = 3$$

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

$$\left(\frac{3}{5}, -7\right)$$

3)  $\left(\frac{3}{5}, -7\right)$

$$g\left(\frac{3}{5}\right) = 3\left|5\left(\frac{3}{5}\right) - 3\right| - 7$$

$$= 3|3 - 3| - 7$$

$$= 3|0| - 7$$

$$= 3(0) - 7 = -7$$

- 4) You are planning a party for your friend. Buffalo chicken sandwiches cost \$5.50 each and a large pizza cost \$11.00. You have a budget of \$125. Write a linear model that shows the different amounts of sandwiches and pizza you can afford. Include 2 let statements.

Write equation in standard form.

$$5.5x + 11y = 125$$

need to get rid of decimals:  
multiply by 10 is one way to do this.

$$55x + 110y = 1250$$

4) Let  $x = \# \text{ Buff chick sand}$   
 Let  $y = \# \text{ pizzas}$   
 $55x + 110y = 1250$

- 5) Between 1980 and 2010, the average yearly salary for a lawyer in New Jersey increased at a linear rate. In 1985 the average salary was \$110,000. In 2000 the average salary was \$200,000.  $x = 0$  represents 1980. Write a linear model that shows the growth of the average salary. Use 2 let statements. Write the equation in **point slope form**.

$$\begin{aligned} (1985, 110,000) &\Rightarrow (5, 110) \\ (2000, 200,000) &\Rightarrow (20, 200) \end{aligned}$$

$$\text{slope} = \frac{200 - 110}{20 - 5} = \frac{90}{15} = 6$$

5) let  $x = \text{year}$  ( $0 = 1980$ )  
let  $y = \text{salary in thousands}$

$$y - 200 = 6(x - 20)$$

or also:

$$\left\{ y - 110 = 6(x - 5) \right\}$$

- 6) If  $f(x) = 2x^3 - 3x^2 - 4x$

Find  $f(-5)$  and  $f(6)$

substitute  $-5$  for  $x$ :

$$\begin{aligned} f(-5) &= 2(-5)^3 - 3(-5)^2 - 4(-5) \\ &= 2(-125) - 3(25) + 20 \\ &= -250 - 75 + 20 \\ &= -325 + 20 \\ &= -305 \end{aligned}$$

TINspire;  $\sqrt{-83}$  or  $84$   
2nd O (catalog)  
abs(

$$6) \underline{f(-5) = -305}$$

$$\underline{f(6) = 300}$$

substitute  $6$  for  $x$ :

$$\begin{aligned} f(6) &= 2(6)^3 - 3(6)^2 - 4(6) \\ &= 2(216) - 3(36) - 24 \\ &= 432 - 108 - 24 \\ &= 324 - 24 \\ &= 300 \end{aligned}$$

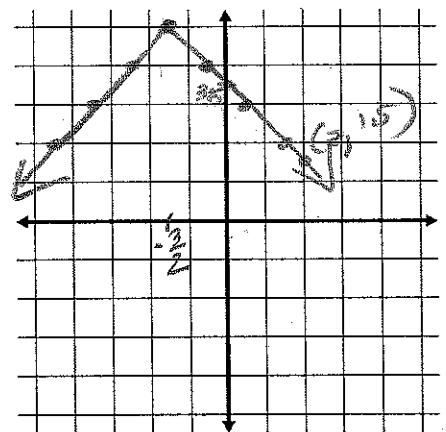
- 7) Use your calculator to graph  $y = -\frac{1}{2}|2x + 3| + 5$

Label the vertex and 2 other points on the graph.  
Write the ordered pair of the 3 points.

Vertex:  $(-\frac{3}{2}, 5)$

Point 1:  $(0, 3.5)$

Point 2:  $(2, 1.5)$



$$2x + 3 = 0$$

$$2x = -3$$

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

$$y = -\frac{1}{2} | 2(-\frac{3}{2}) + 3 | + 5$$

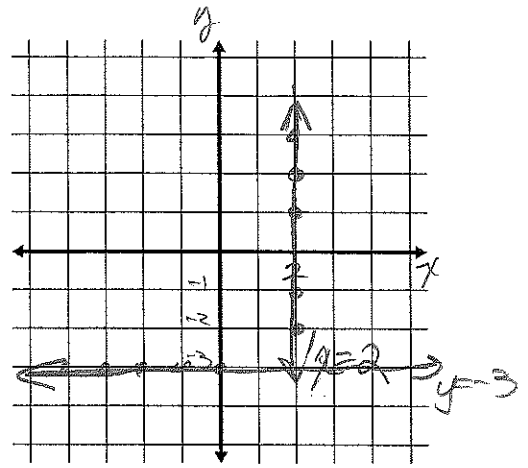
$$y = -\frac{1}{2} | -3 + 3 | + 5$$

$$y = 5$$

8) Graph each line on the same coordinate plane.  
Then find the slope of each line.

Line 1:  $x = 2$  slope: undefined

Line 2:  $y = -3$  slope: zero

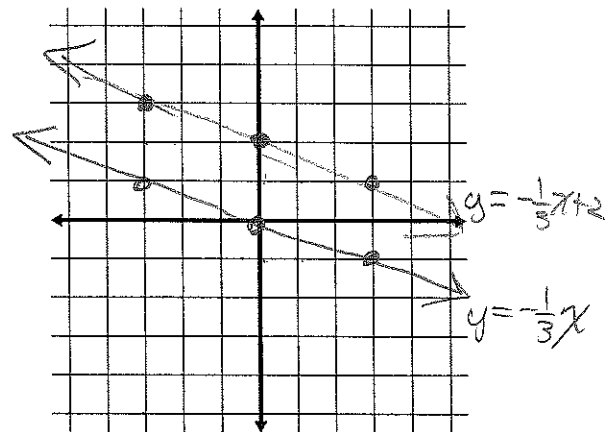


9) Graph a line parallel to  $f(x) = -\frac{1}{3}x$  and write the equation of the line you graphed.

$$m = -\frac{1}{3}$$

$$b = 2$$

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



10) In the table below  $x$  represents a person's shoe size and  $y$  represents their height in inches. Make a scatter plot, draw the line of best fit, and find the equation for the line. Use the graph paper for the graph and the space below for all your work. Make sure to use an appropriate scale, label the graph, and circle the two points on your graph. Find the slope and use the point slope formula, then convert to slope intercept form.

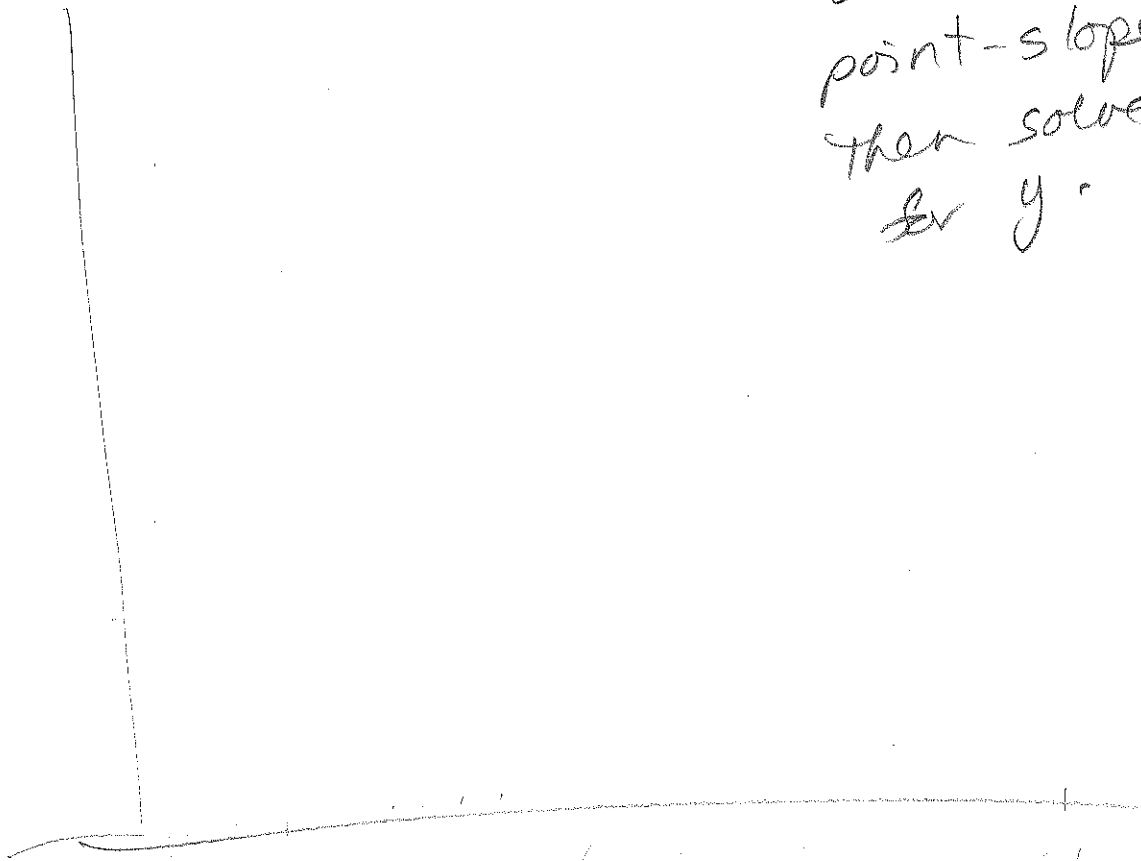
$x$	8.5	10	13	5	6.5	9	11.5	12	7	3.5
$y$	66	70	81	59	63	69	78	77	65	54

- Scatter plot (2 pts)
- Label and scale (2 pts)
- Line of best fit (2 pts)
- Slope (2 pts)
- Final equation (2 pts)

10) Equation: \_\_\_\_\_

answers will vary

Find slope &  
 Choose 1 points  
 on the trend  
 line you  
 draw & use  
 point-slope form.  
 then solve it  
 for  $y$ .



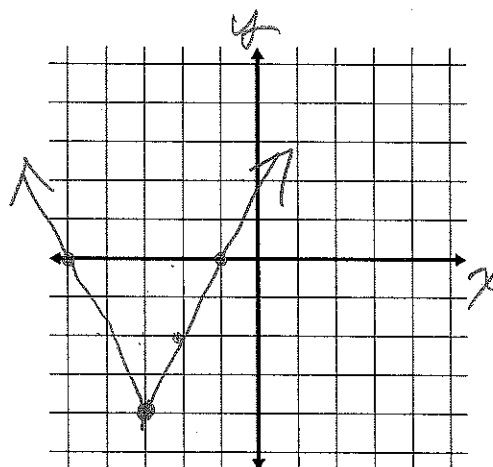
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Algebra II  
Chapter 2 Test Review - No Calculator

- 1) Sketch a quick graph of the function.  
Label the vertex.

$$f(x) = 2|x + 3| - 4$$

Vertex  $(-3, -4)$



- 2) Identify the parent function of the function below and then describe the transformations using the words translates left, right, up, down; reflects over the x axis or not; stretches and/or compresses. Also include the number of units it translates. (ie: 5 units down, 3 units left)

$$f(x) = -\frac{2}{5}|x - 3| - 11$$

$\frac{2}{5} < 1$  compression

$f(x) = |x|$

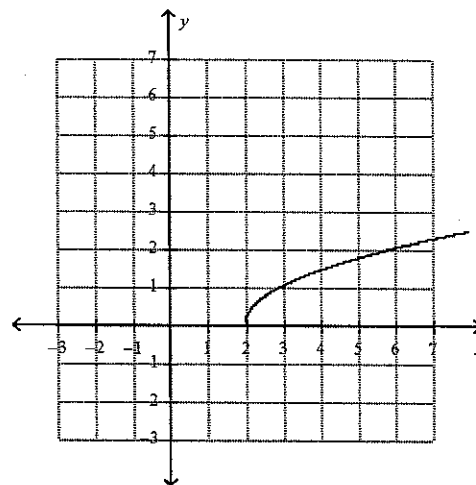
down 11, 3 right  
opens down (reflect over x)  
vertical compression

- 3) Is the graph a function?  
State the domain and range.

Function? Yes

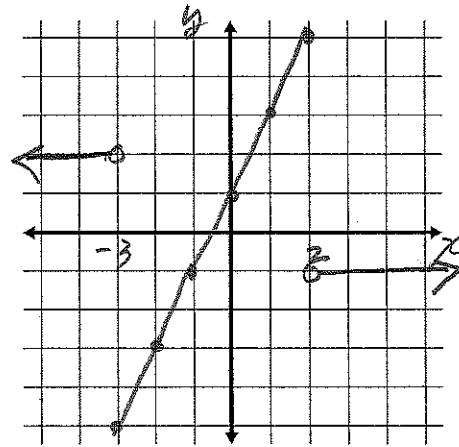
Domain:  $x \geq 2$

Range:  $y \geq 0$



Graph the piecewise function:

Sketch each line softly, then darken the needed intervals.  
Remember your open vs. closed circles.



4)

$$f(x) = \begin{cases} 2, & x < -3 \\ 2x + 1, & -3 \leq x \leq 2 \\ -1, & x > 2 \end{cases}$$

5) For the above piecewise function, find the domain, range and evaluate.

Domain:  $-\infty < x < \infty$

Range:  $-5 \leq y \leq 5$

$f(-8) = 2$

$f(0) = 1$

$f(10) = -1$

6) Give the equation of a line:

a) parallel to  $y = 7 - 3x$

$$y = 4 - 3x$$

b) perpendicular to  $y = 3$

$$x = \pi$$

c) perpendicular to  $y = 2x - 1$  that passes through the point (3, 5)

$$m = -\frac{1}{2} \quad (3, 5)$$

$$y - 5 = -\frac{1}{2}(x - 3)$$