

Name Key

Date \_\_\_\_\_

First Determine if the Sequence is Geometric. Then answer the question it is requesting

1. Given 96, 48, 24, 12, ...  
Write the rule and find  $a_{10}$

$a_n = 96\left(\frac{1}{2}\right)^{n-1}$

$a_{10} = 96\left(\frac{1}{2}\right)^{10-1}$

$a_{10} = 3/16$

2. Given:  $a_n = 2(3)^{n-1}$   
Find 1<sup>st</sup> 4 terms of Geometric Sequence

$2, 6, 18, 54, \dots$

3. Evaluate the geometric sequence described

$\sum_{k=2}^6 2(4)^{k-1}$

$a_2 = 2(4)^{2-1} = 8$

$S_n = \frac{8(1-4^5)}{1-4}$

$= 2,728$

*(Handwritten notes:  $a_2, a_3, a_4, a_5, a_6$  } 5 #s)*

4. Determine the number of terms  $n$  in the geometric sequence series

$a_1 = 3, r = 2, S_n = 381$

$381 = \frac{3(1-2^n)}{1-2}$

$128 = 2^n$

$n = 7$

5. Given 2 terms in the geometric sequence, find the formula

$a_{10} = -1024$  and  $a_5 = 32$

$a_{10} = a_5 r^{10-5}$

$r = -2$

$a_5 = a_1 r^{5-1}$

$a_1 = 2$

$a_n = 2(-2)^{n-1}$

6. Given the formula  $a_n = \frac{1}{3}(2)^{n+2}$  find the 4<sup>th</sup> term and 10<sup>th</sup> term.

$a_4 = \frac{64}{3}$

$a_{10} = \frac{4096}{3}$

Graph the following piecewise functions

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

INC:  $(-\infty, -1)$

DEC:  $(-1, 3)$

Constant:  $(3, \infty)$

What is  $f(-3)$ ?  
 $f(-3) = -2$

8.  $g(x) = \begin{cases} x^2 & x < -2 \\ 2+x & x \geq -2 \end{cases}$

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

Range:  $[0, \infty)$

Point of Discontinuity:  $x = -2$

What is  $g(3)$ ?  
 $g(3) = 5$

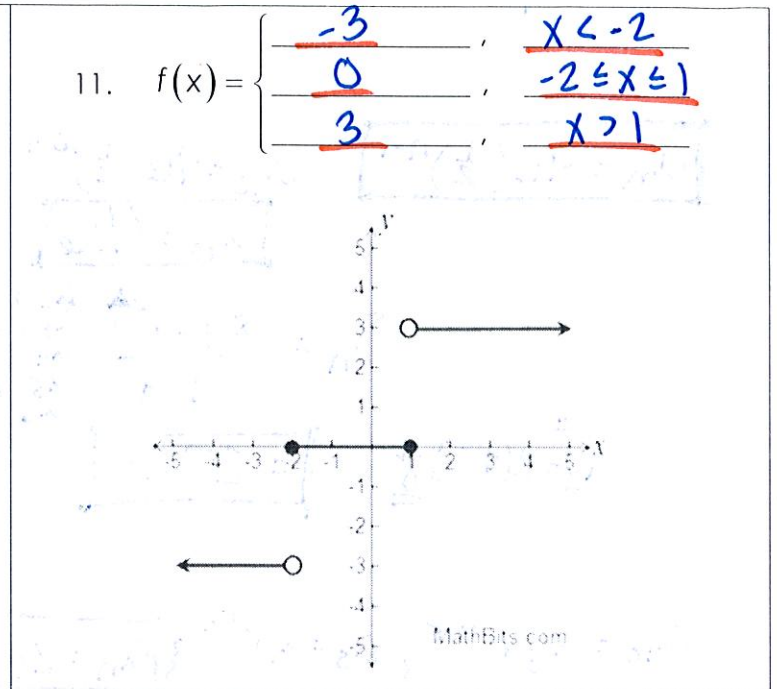
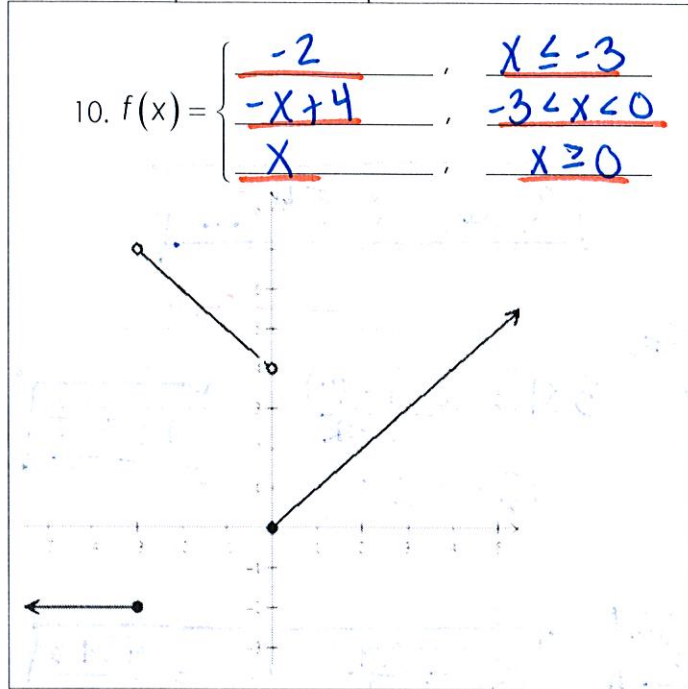
9.  $f(x) = \begin{cases} -4 & x \leq -2 \\ -2 & -2 < x \leq 0 \\ 0 & 0 < x \leq 2 \\ 2 & x > 2 \end{cases}$

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

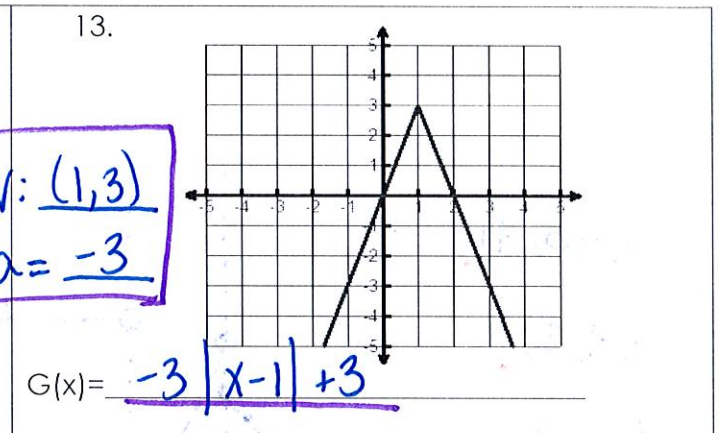
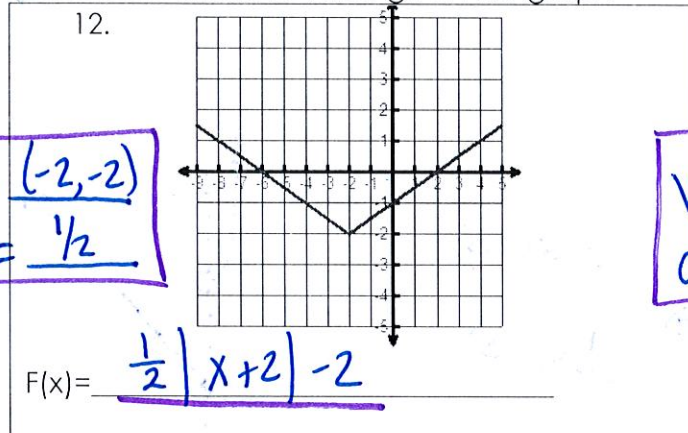
Range:  $\{-4, -2, 0, 2\}$

Points of Discontinuity:  $x = -2, 0, 2$

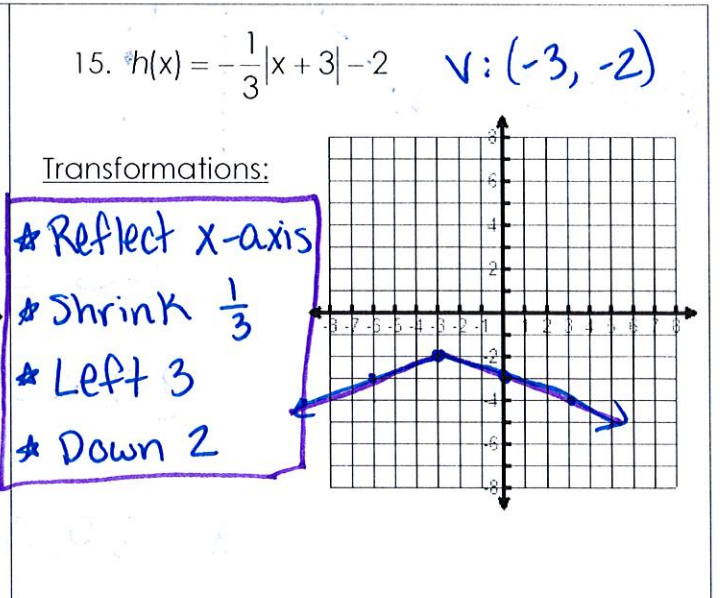
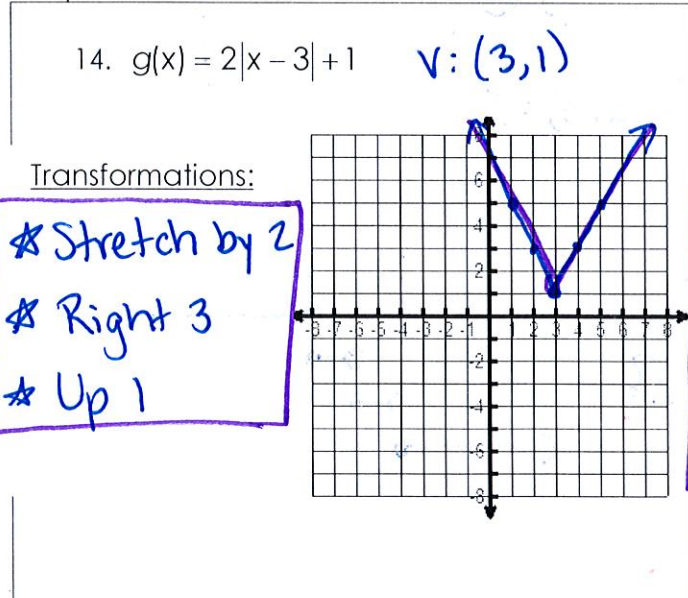
Write the equation of the piecewise function



Write as an absolute value given the graph



Graph each absolute value function



Solve each absolute value equation

<p>16. <math>3 x-2 =12</math></p> <p><math> x-2 =4</math></p> <p><math>x-2=4</math>      <math>x-2=-4</math></p> <p><math>x=6</math>      <math>x=-2</math></p>	<p>17. <math>-2 x+3 -5=7</math></p> <p><math> x+3 =-6</math></p> <p>No Solution</p>	<p>18. <math>3 x+4 =9x</math></p> <p><math> x+4 =3x</math></p> <p><math>x+4=3x</math>      <math>x+4=-3x</math></p> <p><math>x=2</math>      <del><math>x=-1</math></del></p>
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Solve each equation for the given variable.

<p>19. <math>kn+4f=9v</math> Solve for n.</p> <p><math>kn=9v-4f</math></p> <p><math>n = \frac{9v-4f}{k}</math></p>	<p>20. <math>\frac{(qrt-st)}{2}=v</math> Solve for t.</p> <p><math>qrt-st=2v</math></p> <p><math>t(qr-s)=2v</math></p> <p><math>t = \frac{2v}{qr-s}</math></p>	<p>21. <math>D = \frac{11}{5}(P-15)</math> Solve for P.</p> <p><math>\frac{5}{11}D = P-15</math></p> <p><math>\frac{5}{11}D + 15 = P</math></p>
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22. Find the minimum and maximum values of the objective function subject to the given constraints.

Objective Function:

$C = 3x + 4y$

Constraints:

$x \geq 1$

$y \geq 2$

$4x + 2y \leq 20$

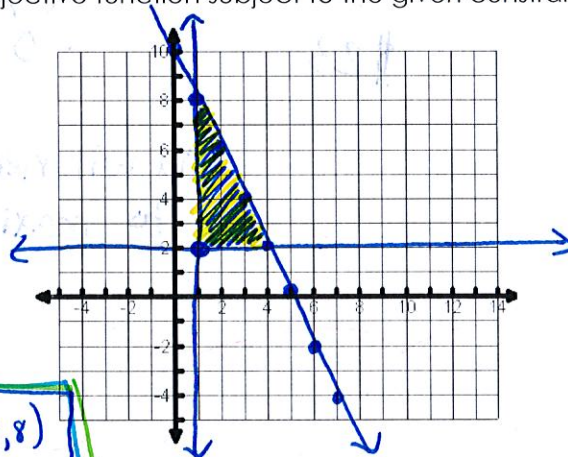
$y \leq -2x + 10$

$(1,2) \rightarrow 11$

$(1,8) \rightarrow 35$

$(4,2) \rightarrow 20$

Min of 11 @ (1,2)  
Max of 35 @ (1,8)



23. Write the objective function and the constraints for the following problem:

A company manufactures inkjet printers and laser printers. The company can make a total of 60 printers per day, and it has 120 labor-hours per day available. It takes 1 labor-hour to make an inkjet printer and 3 labor-hours to make a laser printer. The profit is \$45 per inkjet printer and \$65 per laser printer. How many of each type of printer should the company make to maximize its daily profit?

$x = \text{inkjet}$   
 $y = \text{laser}$

$P = 45x + 65y$

$x + y \leq 60$   
 $x + 3y \leq 120$   
 $x \geq 0$   
 $y \geq 0$

24. A bread shop makes bagels and biscuits for breakfast each morning. The oven at the bread shop can bake up to 100 bagels and biscuits each morning. Each bagel requires 4 ounces of dough and each biscuit requires 2 ounces of dough. There are 360 ounces of dough available each morning. If the bread shop makes a profit of 25 cents per bagel and 15 cents per biscuit, how many bagels and how many biscuits should the bread shop make each day to maximize their profit?

$x =$  Bagel

$y =$  Biscuits

Objective Function:

$P = .25x + .15y$

Constraints:

$x + y \leq 100$

$4x + 2y \leq 360$

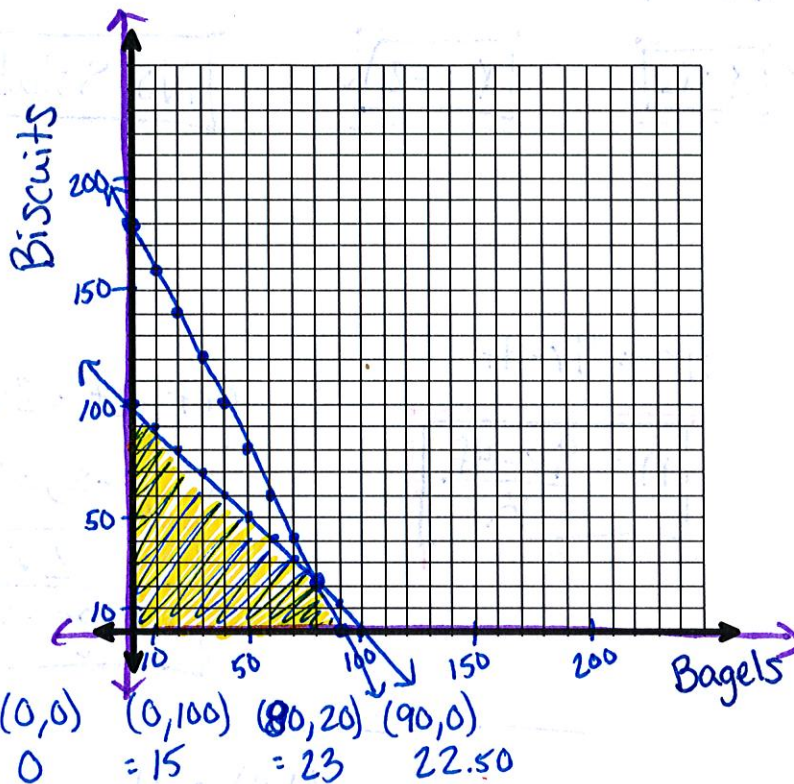
$x \geq 0$

$y \geq 0$

Bagels? 80

Biscuits? 20

Profit? \$23



Concluding Sentence You will need to make 80 Bagels + 20 Biscuits to maximize profit of \$23.

\*\* What did you struggle with? Go on the blog and practice that lesson!\*\*