* If the value you want to plug in does not fit in intervals, the function is undefined at that point *

Function: for each input (x), there's only one output (y).
   * Test with verticle line test *
ex: $f(x) = 3x - 5 \rightarrow$ function notation
   find $f(2)$
   $\boxed{4 = 1} = (2, 1)$

Piecewise function: function that is defined over specific intervals.

Equation	Domain
$f(x) = \begin{cases} x^2 - 2 \\ |x+1| + 3 \\ x \end{cases}$	$x < 7$ $7 \leq x < 12$ $x \geq 12$

a) $g(10)$ $\boxed{14}$
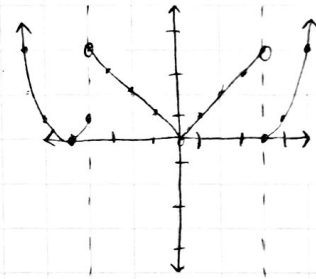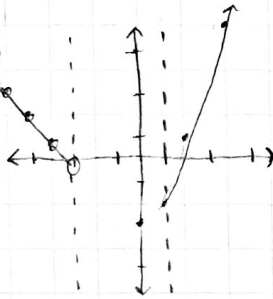
b) $g(20)$ $\boxed{20}$

c) $g(-5)$ $\boxed{23}$

d) $g(+)$ $\boxed{11}$

Graphing
ex: $f(x) = \begin{cases} |x+3|, & x < -3 \\ x^2 - 3, & x \leq 1 \end{cases}$

1) section off domain

$g(x) = \begin{cases} (x+5)^2, & x \leq -4 \\ |x|, & -4 < x < 4 \\ (x-4)^2, & x \geq 4 \end{cases}$

Average rate of change
$$\frac{f(b) - f(a)}{b - a} = \frac{y_2 - y_1}{x_2 - x_1}$$

Average rate of change is the slope between two points.

ex: $f(x) = 3x^2 + 2$
a) $[-2, 5]$ $= f(-2) = 3(-2)^2 + 2 = 14 \rightarrow (-2, 14) \rightarrow \frac{77 - 14}{5 + 2} = \frac{63}{7} = \boxed{9}$
   x values $f(5) = 3(5)^2 + 2 = 77 \rightarrow (5, 77)$

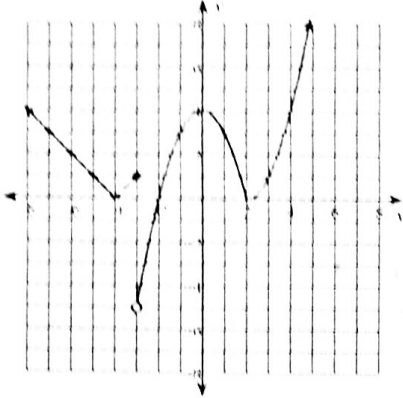Name Lauren Miller   ID: 1

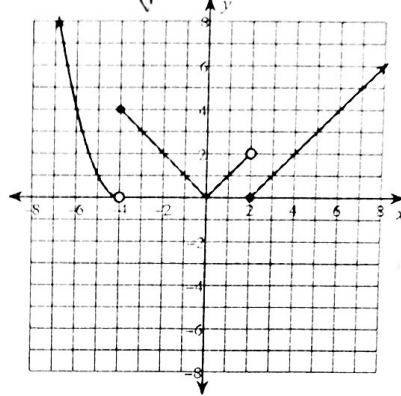Date 10/23/18   Period AA

Write the equation of each function.

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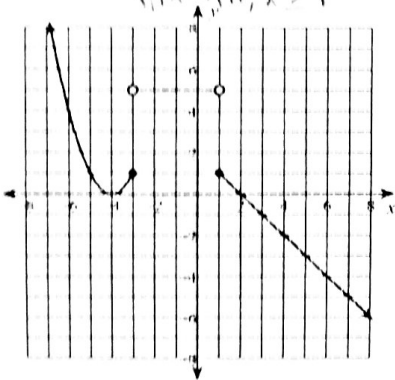

2) $g(x) = \begin{cases} (x+1)^2, & x < -4 \\ |x|, & -4 < x < 2 \\ |x-2|, & x > 2 \end{cases}$

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

4) $g(x) = \begin{cases} |x|-1, & x \leq 0 \\ (x-1)^2, & x > 0 \end{cases}$