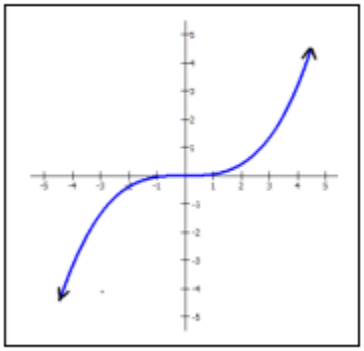
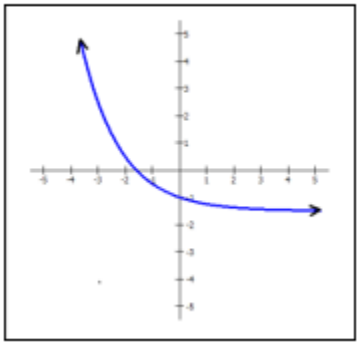
College Algebra **Name**_____

Increasing and Decreasing Intervals:

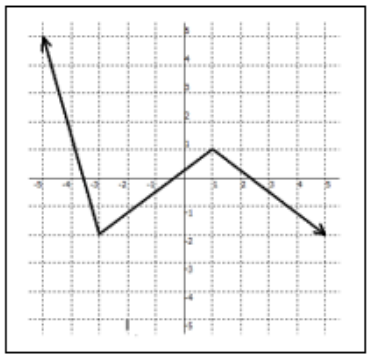
Increasing on $(-\infty, \infty)$ **Decreasing on** $(-\infty, \infty)$



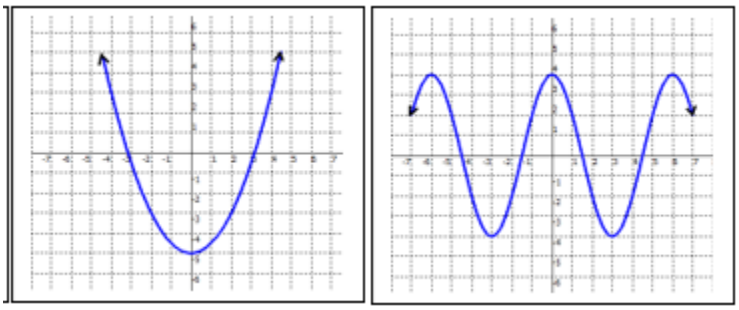


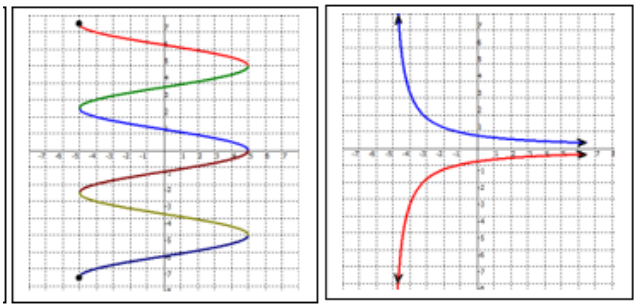
Increasing on $(-3, 1)$

Decreasing on $(-\infty, -3) \cup (1, \infty)$

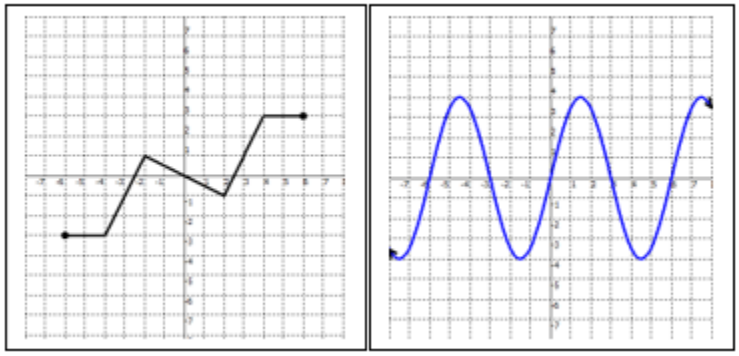


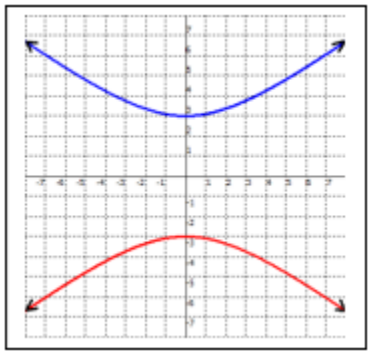
Symmetric to the y-axis: $(a, c) \Leftrightarrow (\_\_, \_\_)$ Symmetric to the x-axis: $(a, c) \Leftrightarrow (\_\_, \_\_)$





Symmetric to the origin (180 degree rotational symmetry) : $(a, c) \Leftrightarrow (\_\_, \_\_)$





Symmetric with respect to all of the above:

$$(a, c) \Leftrightarrow (-a, -c) \Leftrightarrow (-a, -c) \Leftrightarrow (-a, -c)$$

Even Functions: Odd Functions:

$F(-x) = F(x)$ $F(-x) = -F(x)$

Symmetric with respect to the _____. Symmetric with respect to the _____.

Show $g(x) = 5x^2 + 12$ is an even function.

$g(-x) =$

Show $q(x) = \dfrac{2x}{x^2+1}$ is an odd function.

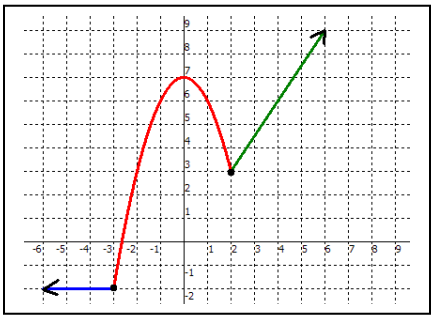
$q(-x) =$

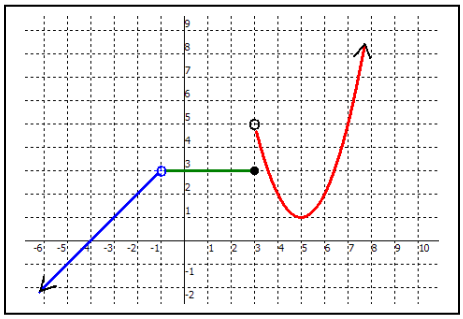
Piecewise Functions

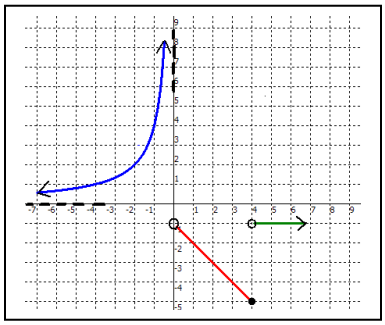
$$g(x) = \begin{cases} -2, & x < -3 \\ 7 - x^2, & -3 \le x < 2 \\ \frac{2}{3}x, & x \ge 2 \end{cases}$$

$$h(x) = \begin{cases} x+4, & x < -1 \\ 3, & -1 < x \le 3 \\ (x-5)^2 + 1, & x > 3 \end{cases}$$

$$f(x) = \begin{cases} -\frac{4}{x}, & x < 0 \\ -1 - x, & 0 < x \le 4 \\ -1, & x > 4 \end{cases}$$







Relative Max. =

Relative Min =

Domain:

Range:

$g(-10) =$

$g(-1) =$

$g(12) =$

Domain:

Range:

$h(-10) =$

$h(-1) =$

$h(12) =$

Domain:

Range:

$f(-10) =$

$f(-1) =$

$f(12) =$

Determine the value of x for each condition.

$g(x) = 6$

$g(x) = -5$

$g(x) = 30$

$h(x) = 1$

$h(x) = 3$

$h(x) = -10$

$f(x) = -1$

$f(x) = 3$

$f(x) = 0$

Difference Quotient.: $\dfrac{f(x+h) - f(x)}{h}$, $h \neq 0$

$f(x) = 5x^2 + 6$ *Find* $f(x+h)$ *and The Difference Quotient* $(simplified)$