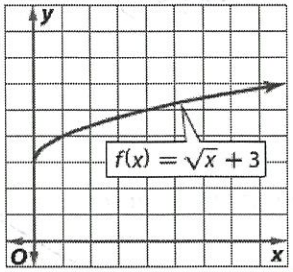
Pre-Calculus
REVIEW 1.1-1.4

Name Key

Domain & Range:

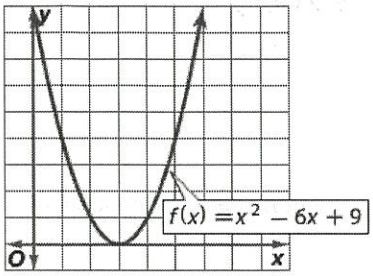
1. Find the domain and range of the graphs or equation. Use interval notation.

a)



D: $[0, \infty)$
R: $[3, \infty)$

b)



D: $(-\infty, \infty)$
R: $[0, \infty)$

c) $f(x) = 2x^3 + x - 1$

D: $(-\infty, \infty)$
R: $(-\infty, \infty)$

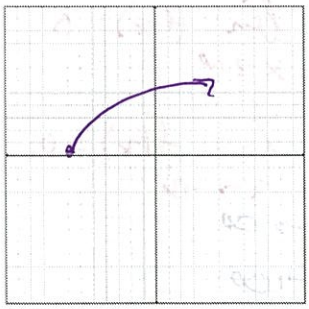
Determining if a Relation is a Function:

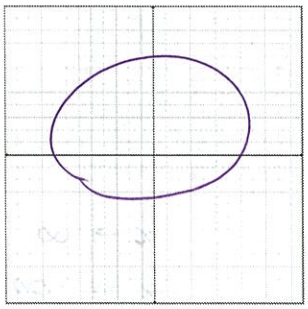
2. Does the following situation represent a function? Why or why not?
During a baseball game, a batter pops up the ball to the infield. Let x stand for the time in seconds and y stand for the height of the ball.

Yes; passes vertical line test

h(t)
t

3. Sketch a graph that is a function and a graph that is not a function.





Evaluating:

4. Use the given piecewise function, $f(x) = \begin{cases} x^2 + 3x \text{ if } x < 2 \\ x + 10 \text{ if } x \geq 2 \end{cases}$, to evaluate the following:

a) $f(-3)$
$(-3)^2 + 3(-3)$
0

b) $f(1)$
$(1)^2 + 3(1)$
4

c) $f(2)$
$(2) + 10$
12

d) $f(5)$
$(5) + 10$
15

5. Given $f(x) = -2x^2 + 7x - 1$, find:

a) $f(c)$

$-2(c)^2 + 7(c) - 1$

$-2c^2 + 7c - 1$

b) $f(c-3)$

$-2(c-3)^2 + 7(c-3) - 1$

$-2(c^2 - 6c + 9) + 7c - 21 - 1$

$-2c^2 + 19c - 40$

y-intercepts and Zeros:

6. Determine the y – intercept and zero(s) of the given functions:

a) $f(x) = x^3 - 16x$ y-int: (0,0)
zeros: (0,0) (-4,0) (4,0)

b) $f(x) = 5\sqrt{x} - 4$ y-int: (0,-4)
zeros: (.64,0)

Continuity:

7. Determine whether the given function is continuous. If discontinuous, identify the type of discontinuity as *infinite*, *jump*, or *removable*.

a) $f(x) = x^2 - 36$ continuous

b) $f(x) = \frac{2}{x+5}$ non-removable
infinite

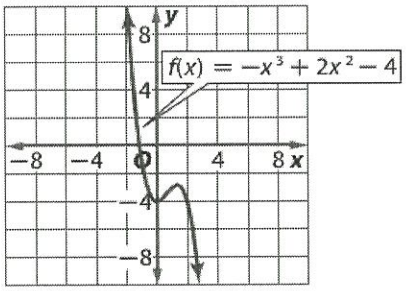
c) $f(x) = \frac{x^2+x-12}{x-3}$ removable

$\frac{(x+3)(x-4)}{x-3}$

End Behavior:

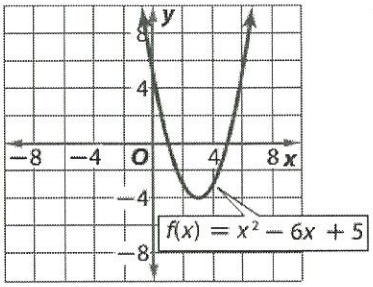
8. Describe the end behavior for each function using limit notation.

a)



$\lim_{x \to \infty} f(x) = -\infty$ $\lim_{x \to -\infty} f(x) = \infty$

b)



$x \to \infty$, $f(x) \to \infty$
$x \to -\infty$, $f(x) \to \infty$

c) $f(x) = -\frac{2}{x}$

$\lim_{x \to \infty} f(x) = 0$

$\lim_{x \to -\infty} f(x) = 0$

Extremas:

9. Use $g(x) = x^3 + 2x^2 - 4x - 6$. State the intervals on which g(x) is increasing, decreasing, or constant and find the extremas. Round values to the nearest hundredth.

(-2,2) (⅔, -7.5)

a) Increasing/Decreasing/Constant:

Increasing: $(-\infty, -2)(.7, \infty)$ Decreasing: $(-2, .7)$

b) Relative Minimums:

$(.7, -7.5)$

c) Relative Maximums:

$(-2, 2)$

d) Absolute Extremas:

none