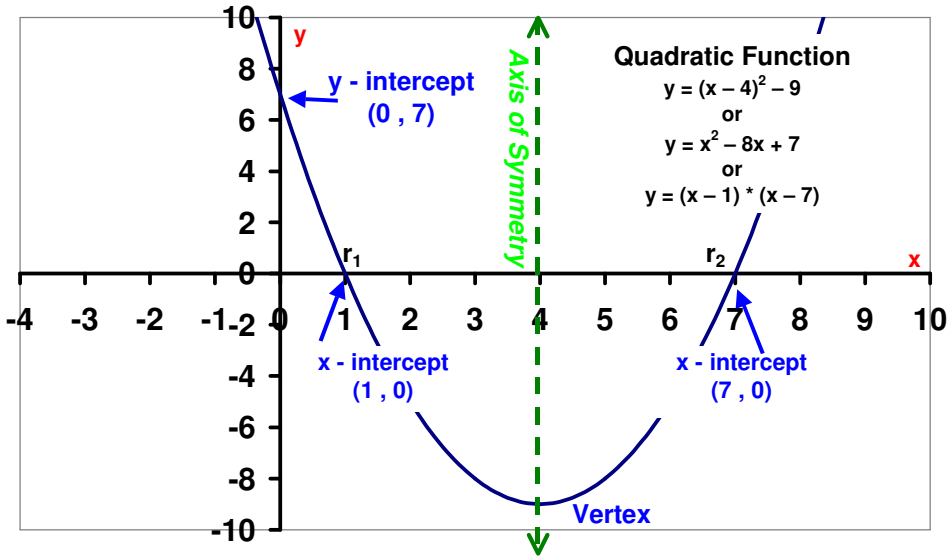
GRADE 11 APPLIED
UNIT A QUADRATICS
ASSIGNMENT – VERTICES AND INTERCEPTS

Name: _____
Date: _____

1. There are lots of significant points to a quadratic function.

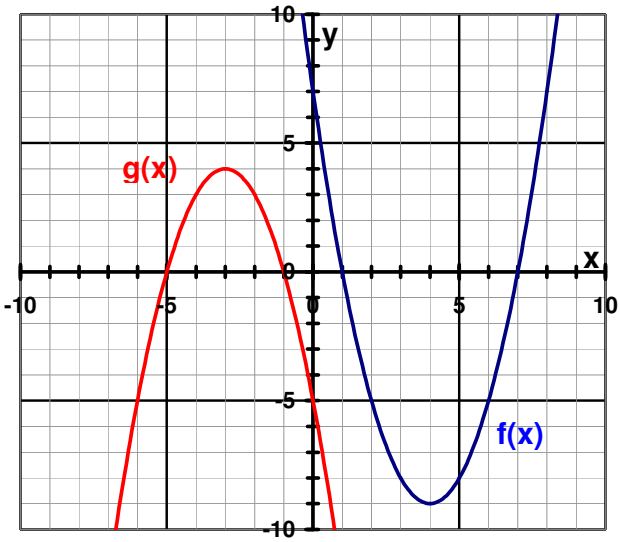


2. There is always a single y-intercept, *up to* two x-intercepts, and always a vertical line of symmetry that runs down through the vertex.

3. For the graphs of the two quadratic functions at the right give their significant points:

a. **f(x)**
y-intercept: (0, ___)
x-intercept(s): (___, 0)
and (___, 0)
vertex: (____, ____)
axis of symmetry: x = _____

b. **g(x)**
y-intercept: (0, ___)
x-intercept(s): (___, 0)
and (___, 0)
vertex: (____, ____)
axis of symmetry: x = _____



assume the significant points are at integer values

4. Given the following quadratic functions use the TI-83 Graphing Calculator to sketch them and to state the window used, y-intercept, x-intercepts, axis of symmetry and vertex and Domain and Range. Round values to two decimal places if necessary. (or wow me with fractions!)

a. **$y = 3x^2$**

y-intcpt: __(0, __)__

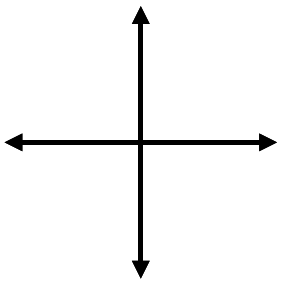
x-intcpt(s): (____, 0) ; ~~(___, 0)~~

axis of symmetry: x = _____

vertex point: (____, ____)

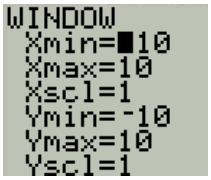
Domain: _____

Range: _____



(sketch only)

Window Used:



b. **$f(x) = x^2 + 8x$**

y-intcpt: __(0, __)__

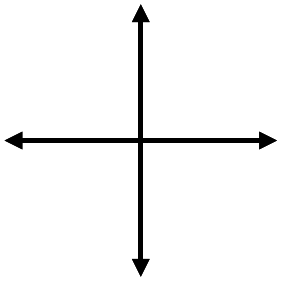
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

c. **$y = -3x^2 + 9x - 8$**

y-intcpt: __(0, __)__

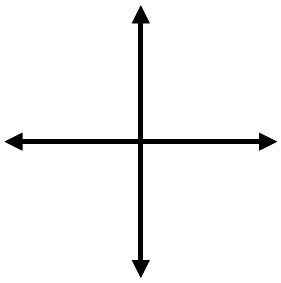
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

d. **$g(x) = (x - 2)(x - 8)$**

y-intcpt: __(0, __)__

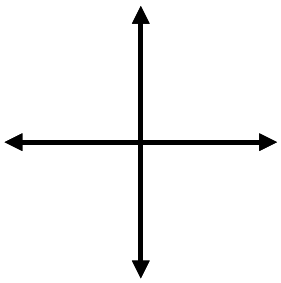
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

d. **$y = (x + 2)(x + 5)$**

y-intcpt: __(0, ___)__

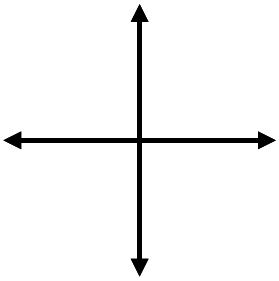
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

e. **$y = -(x + 2)^2$**

y-intcpt: __(0, ___)__

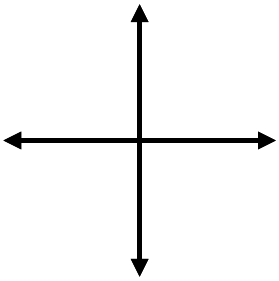
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

f. **$y = (x - 3)^2 + 2$**

y-intcpt: __(0, ___)__

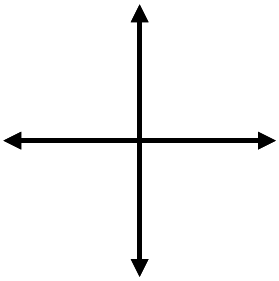
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

Can you start to see some patterns then? In pre-Calc you would learn the patterns, in Applied Math is it only necessary to use the graphing tool.

g. **$y = -(x - 3)^2 + 2$**

y-intcpt: __(0, ___)__

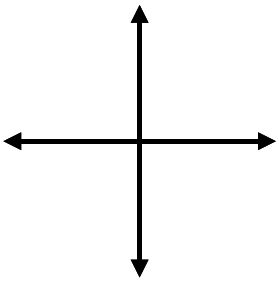
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

h. **$y = 2(x + 4)^2 - 10$**

y-intcpt: __(0, __)__

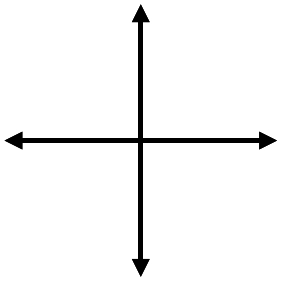
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



(sketch only)

Window Used:

i. **$h(t) = -5t^2 + 30t + 2$**

y-intcpt: __(0, __)__

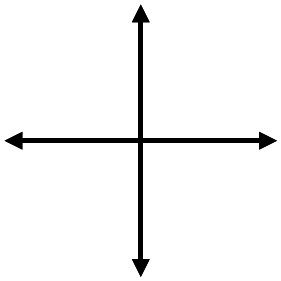
x-intcpt(s): (____, 0) ; (___, 0)

axis of symmetry: x = _____

vertex point: (____, ____)

Domain: _____

Range: _____



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Window Used:

5. **Word Problem**. City traffic at Higgins and Main in the morning rush hour is modeled pretty well by the quadratic equation **$n(t) = -10t^2 + 165t - 600$** where **n(t)** is the number of cars per minute as a function of the time of the morning ***t***.

a. what is the vertex of the traffic function? _____

b. the vertex represents the peak traffic flow at the peak time.

(1) what is the peak time of traffic: _____ (hours: mins AM)

(2) what is the flow of traffic at the peak time? _____ (cars per min)

c. according to this 'formula' that 'models' traffic flow at morning rush hour when is traffic flow at zero cars per minute? _____