*Review 4.1-4.3 (****Key****)*

1. Solve by factoring:

 **Set equation , factor nonzero side, and solve for *x*:**

 **or**

 **,**

2. Solve by the square root method: 17

 **Isolate squared variable term, apply square root property, simplify to solve for *x*:**

 **Caution: Remember to insert "" to obtain the 2 possible solutions**

 **or**

3. The graph of a quadratic equation is given. Find any possible solution(s).



 **Look for the *x*-value(s) where the graph intersects the *x*-axis: and**

4. Given the equation , find the discriminant **and** state the nature of the solution(s).

 **Discriminant is given by:**

 **> 0, two distinct real solutions**

 **< 0, no real solutions (complex roots)**

 **= 0, one real solution (double root)**

 **Discriminant is positive; two distinct real solutions**

5. Do the following for the quadratic function . Round answer to 2 decimal places

 where needed.

 a. State the vertex. b. Find the -intercept. c. Find any -intercept(s). d. Graph the parabola. e. Write the equation of the axis of symmetry f. State the domain and range.

 **a. *x*-coordinate: = 1/2**

 ***y*-coordinate: *y***

 **Vertex: or**

 **b. *y*-intercept: Let *x* = 0 and solve for *y*: *y***

 **c. *x-*intercept: Let *y* = 0 and solve for *x*:**

 **= 0**

 **= 0**

 **,**

 **and**

 **d. Graph:**

****

 **e. Equation of the axis of symmetry: Vertical line passing through the vertex**

 **Vertex is (0.5, 6.25); the equation of the axis of symmetry is 1/2 or**

 **f. Domain: Possible value of the input (*x*-values) (**

 **Range: Possible value of the output (*y*-values) [**

6. The height in feet, *h*, of a projectile after *t* seconds is given by

 Use your graphing calculator to answer the questions:

 a. When did the launched projectile reach ground level? Round answer to 2 decimal places.

 b. During what interval(s) did the projectile reach an altitude of more than 182 feet?

  Round answer to 2decimal places.

 **a. Ground level: height = 0**

  **Look for value(s) of *t* when**

 ***Solving Algebraically:***

 **(4*t*)(4*t* 33) = 0**

 **4*t* = 0 or 4*t* 33 = 0**

 ***t* = 0 or  *t* = 8.25**

 **The projectile reached ground level at 8.25 seconds.**

 **(Caution: 0 seconds would imply height of the projectile *before* it was launched!)**

 ***Solving Graphically:***

 **Hint for window: Vertex will give us highest point of the graph**

 ***t* = *t* = (()**

 **Let Y1 = height equation, and Y2 = ground level; find intersection when launched projectile**

 **reached height of zero feet.**

   

  **The projectile reached ground level at 8.25 seconds.**

 **b. Altitude more than 182 feet:**

 **Let Y1 = height equation, and Y2 = 182**



 **There are 2 times when the launched projectile reached a height of 182 (on its way up,**

 **and again on its way down):**

 

 **Therefore, the projectile reached an altitude of *more than* 182 feet between 1.75 and 6.5**

 **seconds, or during the interval (1.75, 6.5).**

****

7. Determine where .



 **The graph is above *or* on the *x*-axis at these intervals: ,**