

Notes 5/23/16 Monday

Test items to know for test tomorrow (5/24/16)

- Standard form $f(x) = ax^2 + bx + c$
- Vertex form $f(x) = a(x - h)^2 + k$
- Vertex, axis of symmetry $x = \frac{-b}{2a}$, direction of opening (a value (coefficient) if positive or negative) “positive goes up” and “negative goes down”
- Minimum / maximum value (if minimum parabola is facing up) (if maximum parabola is facing down) (the y value of vertex is max or min)
- Factoring
- Solve a quadratic (factoring and quadratic formula)

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- Discriminant of quadratic $b^2 - 4ac$

Understanding the discriminant	
Discriminant $b^2 - 4ac$	# of real roots
$b^2 - 4ac > 0$	2 real roots
$b^2 - 4ac = 0$	1 real roots
$b^2 - 4ac < 0$	No real roots

- Word problems
- Systems of linear-quadratic equations
 - 5 steps
 - 1. Set equations equal to each other
 - 2. Get everything to one side
 - 3. Factor
 - 4. Set the factors equal to zero to get the roots, solutions, x-intercepts
 - 5. Substitute into the easier (linear) equation to get the y-value for the solution ordered pair
 - The graphs will intersect twice to get 2 solutions
 - The graphs will intersect once to get 1 solution
 - The graphs will not intersect at all (no solutions)

Linear-quadratic systems worksheet

1) $y = x^2 + 3x - 5$

$$y = x + 3$$

$x^2 + 3x - 5 = x + 3$ step 1 subtract x and 3 to the other side

$$x^2 + 2x - 8 = 0$$
 step 2 factor

$(x + 4)(x - 2)$ step 3 set each equal to zero

$$x + 4 = 0 \quad x - 2 = 0$$

$$x = -4 \quad x = 2$$

$y = x + 3$; plug in -4 for x and get -1 ($-4, -1$)

$y = x + 3$; plug in 2 for x and get 5 ($2, 5$)

4) $y = x^2 - 24$

$$y = x - 12$$

$x - 12 = x^2 - 24$ subtract x and add 12 to the right side

$$x^2 - x - 12$$
 factor

$(x - 4)(x + 3)$ set equal to zero

$$x = 4 \quad \text{and} \quad x = -3$$

If x is 4 , when you substitute into $x - 12$, then $y = -8$ ($4, -8$)

If $x = -3$, then $x - 12$ is -15 ($-3, -15$)