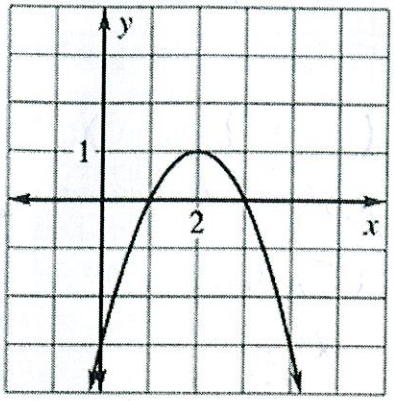
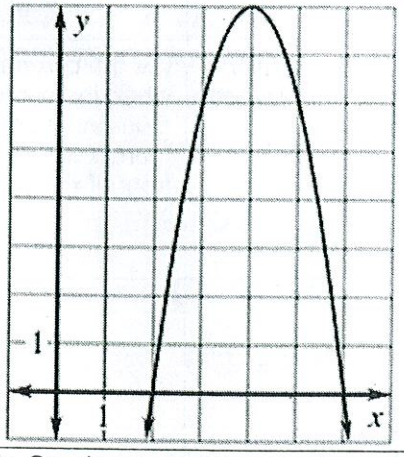
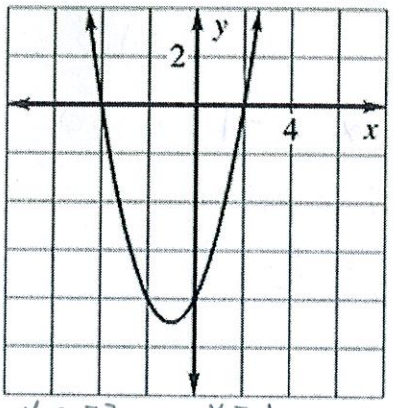
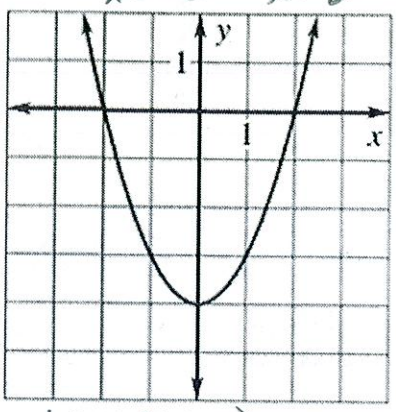
Honors Algebra I
Unit 3 Review – Solving Quadratics

Name:_____
Date: _____ Period: _____

What you need to know & be able to do	Things to remember	Examples	
1. Solve a quadratic function by graphing	Determine where the graph crosses the x-axis. Solution is written as x = _____. Solutions are called: x-intercepts zeros roots	a. Solve by graphing $x=1$ $x=3$ 	b. Solve by graphing $x=2$ $x=4$ 
2. Determine the equation of a parabola using its zeros.	The zeros and factors in the equation have opposite signs.	a. Create an equation, in factored form, to represent the following graph.  $x=-2$ $x=1$ $y=(x+2)(x-1)$	b. Create an equation, in factored form, to represent the following graph. $x=-3$ $x=3$  $y=(x+3)(x-3)$
3. Solve equations in factored form.	Zero Product Property	a. Solve $(x-7)(x+3)=0$ $x=7$ $x=-3$	b. Solve: $(x-4)(5x-7)=0$ $x=4$ $x=\frac{7}{5}$
4. Solve equations by factoring when a = 1.	Use number diamonds if there is no number in front of x^2.	a. Solve $x^2-9x+20=0$ $(x-5)(x-4)=0$ $x=5$ $x=4$	b. Solve $x^2-6x-16=0$ $(x-8)(x+2)=0$ $x=8$ $x=-2$

		c. $x^2 - 13x + 47 = 7$ $x^2 - 13x + 40 = 0$ $(x-8)(x-5) = 0$ $x = 8$ $x = 5$	d. $x^2 - 100 = 0$ $(x+10)(x-10) = 0$ $x = 10$ $x = -10$
5. Solve equations by factoring when a is not 1	Use the box method when the number diamond works, but there is a number in front of x^2.	a. Solve $5x^2 - 16x + 12 = 0$ $(5x^2 - 10x)(6x + 12) = 0$ $5x(x-2) - 6(x-2) = 0$ $(5x-6)(x-2) = 0$ $x = \frac{6}{5}$ $x = 2$ 60 / -10 / -6 / -16	b. Solve $3x^2 - 18x + 15 = 0$ $(3x^2 - 3x)(-15x + 15) = 0$ $3x(x-1) - 15(x-1) = 0$ $(3x-15)(x-1) = 0$ $x = \frac{15}{3}$ $x = 1$ $x = 5$ 45 / -3 / -15 / -18
		c. Solve $3x^2 + 2x - 8 = 0$ $(3x^2 + 6x)(-4x - 8) = 0$ $3x(x+2) - 4(x+2) = 0$ $(3x-4)(x+2) = 0$ $x = \frac{4}{3}$ $x = -2$ -24 / 6 / -4 / 2	d. $6x^2 - 5x - 11 = -5$ $6x^2 - 5x - 6 = 0$ $(6x^2 - 9x)(4x - 6) = 0$ $3x(2x-3) - 2(2x-3) = 0$ $(3x-2)(2x-3) = 0$ $x = \frac{2}{3}$ $x = \frac{3}{2}$ -36 / -9 / 4 / -5
6. Solve equations by factoring GCF	Use factoring by GCF when you have two terms (a & b) and both contain an x. One of the solutions will always be 0.	a. $x^2 - 4x = 0$ $x(x-4) = 0$ $x = 0$ $x = 4$	b. $12x^2 = -36x$ $12x^2 + 36x = 0$ $12x(x+3) = 0$ $x = 0$ $x = -3$
7. Solve equations by finding square roots.	Use solving by square roots when your equations have parenthesis or two terms (a & c).	a. $x^2 = 12$ $x = \pm\sqrt{12}$ $4 \cdot 3$ $x = \pm 2\sqrt{3}$	b. $8x^2 = 392$ $x^2 = 49$ $x = \pm 7$
		c. $7x^2 - 3 = 445$ $7x^2 = 448$ $x^2 = 64$ $x = \pm 8$	d. $(x-4)^2 = 9$ $x - 4 = \pm 3$ $x = 4 \pm 3$ $x = 4+3$ $x = 4-3$ $x = 7$ $x = 1$

		e. $2(x+2)^2 = 72$ $(x+2)^2 = 36$ $x+2 = \pm 6$ $x = -2 \pm 6$ $x = -2+6 = 4$ $\quad x = -2-6 = -8$	f. $3(x-3)^2 + 2 = 26$ $3(x-3)^2 = 24$ $(x-3)^2 = 8$ $x-3 = \pm\sqrt{8}$ ($\sqrt{8} = 2\sqrt{2}$) $x-3 = \pm 2\sqrt{2}$ $x = 3 \pm 2\sqrt{2}$
8. Solve equations by completing the square	Move the c term to the right side Use $\left(\frac{b}{2}\right)^2$ to complete the square and then apply square root method	17. Solve $x^2 + 4x + 11 = 10$ $x^2+4x = -1+4$ $(x+2)^2 = 3$ $x+2 = \pm\sqrt{3}$ $x = -2 \pm \sqrt{3}$	18. Solve $x^2 - 16x + 52 = 0$ $x^2-16x = -52+64$ $(x-8)^2 = 12$ $x-8 = \pm\sqrt{12}$ ($\sqrt{12} = 2\sqrt{3}$) $x-8 = \pm 2\sqrt{3}$ $x = 8 \pm 2\sqrt{3}$
9. Solve equations by using Quadratic Formula $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$	Use Q.F. when the equation is in standard form and number diamonds does not work.	a. $x^2 + 10x + 15 = 0$ b^2-4ac $(10)^2-4(1)(15)$ 40 2R $\frac{-10 \pm \sqrt{40}}{2(1)}$ (4, 10) $\frac{-10 \pm 2\sqrt{10}}{2}$ $-5 \pm \sqrt{10}$	b. $2x^2 + 10x = 1$ $2x^2+10x-1=0$ b^2-4ac $(10)^2-4(2)(-1)$ 92 RR $\frac{-10 \pm \sqrt{92}}{2(2)}$ (4, 23) $\frac{-10 \pm 2\sqrt{23}}{4}$ $\frac{-5 \pm \sqrt{23}}{2}$
		c. $3x^2 + 6x + 3 = 0$ b^2-4ac $(6)^2-4(3)(3)$ 0 1R $\frac{-6 \pm \sqrt{0}}{2(3)}$ $\frac{-6 \pm 0}{6} = \frac{-6}{6} = -1$	d. $8x^2 - 4x + 7 = 2$ $8x^2-4x+5=0$ b^2-4ac $(-4)^2-4(8)(5)$ -144 NRS

10. Use the discriminant to determine the number of solutions	Discriminant: $b^2 - 4ac$ If the discriminant is: Positive: two real Zero: one real Negative: zero real	a. Calculate the discriminant and tell number of solutions: $6x^2 + 2x + 1 = 0$ b^2-4ac $(2)^2-4(6)(1)$ -20 NRS	b. Calculate the discriminant and tell how many times it will cross the x-axis. $6x^2 - 7x - 3 = 0$ b^2-4ac $(-7)^2-4(6)(-3)$ 121 2R
11. Determine the best method for solving quadratic equations.	Use graphic organizer to determine the best method for solving each equation.	a. $x^2 - 9 = 5$ SQRT $x^2 = 14$ $x = \pm\sqrt{14}$	b. $6x^2 + 8x + 1 = 0$ Quad F b^2-4ac $(8)^2-4(6)(1)$ 40 $\frac{-8 \pm \sqrt{40}}{2(6)} < \frac{4}{10}$ $\frac{-8 \pm 2\sqrt{10}}{12}$ $\frac{-4 \pm \sqrt{10}}{6}$
		c. $3(x + 5)^2 = 64$ SQRT $(x+5)^2 =$	d. $5x^2 - 7x = 0$ GCF $x(5x-7)=0$ $x=0$ $x=\frac{7}{5}$
		e. $x^2 + 12x + 30 = -5$ FACTORS $x^2+12x+35=0$ $(x+7)(x+5)=0$ $x=-7$ $x=-5$	f. $3x^2 + 13x + 12 = 0$ FACTOR $(3x^2+9x)+(4x+12)=0$ $3x(x+3)+4(x+3)=0$ $(3x+4)(x+3)=0$ $x=-\frac{4}{3}$ $x=-3$ 36 / 4 / 9 / 13
		g. $5(x - 2)^2 = 125$ SQRT $(x-2)^2=25$ $x-2=\pm5$ $x=2\pm5$ $x=2+5$ $x=2-5$ $=7$ $=-3$	h. $5x^2 - 3x - 1 = 7$ FACTOR $5x^2-3x-8=0$ $(5x^2+5x)(-8x-8)=0$ $5x(x+1)-1(x+1)=0$ $(5x-1)(x+1)=0$ $x=15$ $x=-1$ -40 / 5 / -8 / -3
		i. $x^2 - 16 = 0$ FACTOR SQRT $x^2=16$ $x=\pm4$	j. $x^2 - 15x + 56 = 0$ FACTOR $(x-8)(x-7)=0$ $x=8$ $x=7$