



Directions: We will be factoring and solving quadratics frequently throughout this unit. Below are "I Can..." statements from your Math 2 coursework. You should read the I Can Statement then complete the problem in the Prove It column. Tomorrow you will check your work. If it is not correct, you need to complete the Improve It column at the indicated station.

	I can...	Prove It	Improve It
<p>1</p> <p>Factor a trinomial where $a=1$.</p>	<p>Prove It</p> <p>$x^2 - 2x - 24$</p> <p>$a=1$ * $b=-2$ $c=-24$</p>  <p>$x^2 - 6x + 4x - 24$ $(x^2 - 6x) + (4x - 24)$ $x(x - 6) + 4(x - 6)$ $(x - 6)(x + 4)$</p> <p>* If you recognize when $a=1$ you can go straight from the diamond into the factors. But ONLY when $a=1$.</p> <p>Check your work: Correct _____ Incorrect _____ (If your answer is incorrect you need to go to Station 1.)</p>	<p>Improve It</p> <p>Read through Factoring Quadratics using the Diamond handout. Focus on Example One. Then complete the problems at the station which match this "I can" statement.</p>	
<p>2</p> <p>Factor a trinomial where $a \neq 1$.</p>	<p>Prove It</p> <p>$2x^2 - 7x + 6$</p> <p>$a=2$ $b=-7$ $c=6$</p> <p>no shortcut</p>  <p>$2x^2 - 4x - 3x + 6$ $(2x^2 - 4x) + (-3x + 6)$ $2x(x - 2) + -3(x - 2)$ $(x - 2)(2x - 3)$</p> <p>Check your work: Correct _____ Incorrect _____ (If your answer is incorrect you need to go to Station 1.)</p>	<p>Improve It</p> <p>Read through Factoring Quadratics using the Diamond handout. Focus on Example 2. Then complete the problems at the station that focus on this "I can" statement.</p>	

3	<p>Solve a quadratic equation where $a > 1$ by factoring.</p>	<p>Read the step to solving at the station then practice the two problems provided.</p>
4	<p>Factor a difference of squares.</p>	<p>Work through the multiplication problems to find the pattern then practice the two factoring problems.</p>
5	<p>Solve a quadratic equation with a perfect square trinomial by factoring.</p>	<p>Work through the multiplication problems to find the pattern then practice the problem provided.</p>

$6x^2 + 5x - 4 = 4$
 $6x^2 + 5x - 4 = 0$
 $6x^2 - 3x + 8x - 4 = 0$
 $3x(2x - 1) + 4(2x - 1) = 0$
 $(2x - 1)(3x + 4) = 0$
 $2x - 1 = 0$ or $3x + 4 = 0$
 $2x = 1$ or $3x = -4$
 $x = \frac{1}{2}$ or $x = -\frac{4}{3}$

$9x^2 - 36 = (3x + 6)(3x - 6)$
 $(3x)^2 - (6)^2$
 $3(x + 2) \cdot 3(x - 2)$
 $9(x + 2)(x - 2)$

$49x^2 + 112x + 64 = 0$
 $(7x)^2 + 2(7x)(8) + (8)^2$
 $(7x + 8)^2 = 0$
 $7x + 8 = 0 \rightarrow 7x = -8$
 $x = -\frac{8}{7}$

Check your work: Correct _____ Incorrect _____
 (If your answer is incorrect you need to go to Station 2.)

6	Identify the axis of symmetry without a calculator.	Read the reminder of how to find the axis of symmetry from an equation then do the two practice problems.
7	Solve a quadratic using the quadratic formula	Read the example using the Quadratic formula then complete problems 1 & 2.

$$f(x) = 3x^2 + 12x - 2$$

$$a = 3 \quad b = 12 \quad c = -2$$

$$A.O.S. \quad X = \frac{-b}{2a}$$

$$X = \frac{-12}{2(3)}$$

$$X = -\frac{12}{6}$$

$$X = -2$$

Check your work: Correct _____ Incorrect _____
 (If your answer is incorrect you need to go to Station 4.)

$$3x^2 - 2 = -7x$$

$$3x^2 + 7x - 2 = 0$$

$$a = 3 \quad b = 7 \quad c = -2$$

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

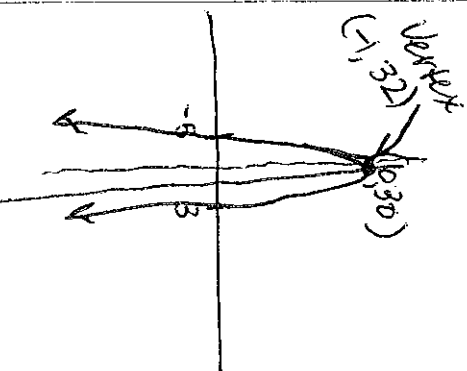
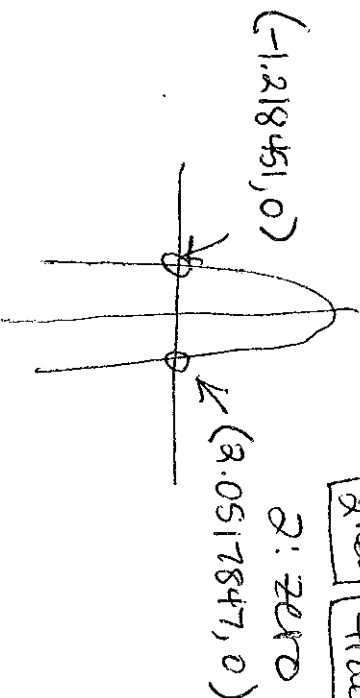
$$X = \frac{-7}{2(3)} \pm \frac{\sqrt{(7)^2 - 4(3)(-2)}}{2(3)}$$

$$X = \frac{-7}{6} \pm \frac{\sqrt{49 + 24}}{6}$$

$$X = \frac{-7}{6} \pm \frac{\sqrt{73}}{6}$$

$$X = \frac{-7}{6} + \frac{\sqrt{73}}{6} \quad \text{or} \quad X = \frac{-7}{6} - \frac{\sqrt{73}}{6}$$

Check your work: Correct _____ Incorrect _____
 (If your answer is incorrect you need to go to Station 6.)

<p>8 Sketch a graph of a quadratic without my calculator</p> 	<p>$g(x) = -2(x+5)(x-3)$</p> <p>Zeros at $x+5=0$ $x-3=0$ $x=-5$ $x=3$</p> <p>$a=-2$ faces downward & is more narrow than standard parabola</p> <p>y-intercept at $g(0) = -2(0+5)(0-3) = -2(5)(-3) = 30$</p> <p>Check your work: Correct _____ Incorrect _____ (If your answer is incorrect you need to go to Station 4.)</p>	<p>Complete problems 1-3 to learn how to sketch a graph without a calculator.</p> <p>axis of symmetry will be exactly half-way between the zeros so average of zeros is</p> <p>A.O.S. $x = \frac{-5+3}{2} = \frac{-2}{2} = -1$ $x = -1$</p> <p>Vertex at $g(-1) = -2(-1+5)(-1-3) = -2(4)(-4) = 32$</p> <p>$(-1, 32)$</p>
<p>9 Solve a quadratic equation using a graphing calculator.</p>	<p>$-6x^2 + 5x = -15$</p> <p>$-6x^2 + 5x + 15 = 0$</p> <p><input type="checkbox"/> and <input type="checkbox"/> calc</p>  <p>2: zero</p> <p>Check your work: Correct _____ Incorrect _____ (If your answer is incorrect you need to go to Station 7.)</p>	<p>Read IM2 Ch. 12 PG. 880 Calculator box Complete IM2 Ch. 12 PG. 891 #5a-d (do only "zeros:")</p>

10	<p>Complete the square to write a quadratic equation in vertex form.</p> $x^2 + 10x + 18 = g(x)$ $x^2 + 10x = g(x) - 18$ $x^2 + 10x + \underline{\quad} = g(x) - 18 + \underline{\quad}$ $\frac{10}{2} = 5$ $5^2 = 25$ $x^2 + 10x + \underline{25} = g(x) - 18 + \underline{25}$ $(x + 5)^2 = g(x) + 7$ $(x + 5)^2 - 7 = g(x)$ <p>Vertex at $(-5, -7)$</p>	<p>Read through the explanation that goes with this "1 can" statement then work through problems 1 & 2.</p>
11	<p>Complete the square to solve a quadratic equation.</p> <p>Check your work: Correct _____ Incorrect _____ (If your answer is incorrect you need to go to Station 8.)</p> $3x^2 + 24x = -15$ $3(x^2 + 8x + \underline{16}) = -15 + \underline{48}$ $\frac{1}{2}(8) = 4 \quad 3(16) = 48$ $4^2 = 16$ $\frac{3(x+4)^2}{3} = \frac{\cancel{33}33}{3}$ $(x+4)^2 = 11$ $\sqrt{(x+4)^2} = \pm\sqrt{11}$ <p>OR</p> $x+4 = \sqrt{11} \quad x = -4 + \sqrt{11}$ $x+4 = -\sqrt{11} \quad x = -4 - \sqrt{11}$ <p>Check your work: Correct _____ Incorrect _____ (If your answer is incorrect you need to go to Station 8.)</p>	<p>This has two parts: First read the explanation of what a perfect square trinomial is and try the practice problems. Then read the example of how to use completing the square to solve a quadratic.</p>