INSTRUCTOR GUIDANCE EXAMPLE: Week Four Discussion

Solving Quadratic Equations

#79 pg 637: Solve by Factoring

There is another way this problem could be solved (by **completing the square** which has already been done to it) but our instructions say to solve by **factoring**. This will require us to multiply out the left side and then subtract 9/4 from both sides to leave the right side zero.

$(p + ½)^2 = 9/4$	First we need to expand the left side by FOIL.
$p^2 + p + ¼ = 9/4$	Subtract 9/4 from both sides.
$p^2 + p – 2 = 0$	Since ¼ – 9/4 = -8/4 = -2 we now are free of the fractions.
$(p + 2)(p – 1) = 0$	Left side is **factored**.
$p + 2 = 0$ or $p – 1 = 0$	Using the Zero Factor Property.
$p = -2$ or $p = 1$	Our solutions.
{-2, 1}	Solution set presented.

Check: $(p + ½)^2 = 9/4$ $(p + ½)^2 = 9/4$

$(-2 + ½)^2 = 9/4$ $(1 + ½)^2 = 9/4$

$(-3/2)^2 = 9/4$ $(3/2)^2 = 9/4$

$9/4 = 9/4$ $9/4 = 9/4$

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$-x^2 + x + 6 = 0$	Factor -1 out of all terms first.
$-1(x^2 – x – 6) = 0$	Divide both sides by -1
$x^2 – x – 6 = 0$	Ready for **factoring**.
$(x – 3)(x + 2)= 0$	Left side is factored.
$x – 3 = 0$ or $x + 2 = 0$	Using the Zero Factor Property.
$x = 3$ or $x = -2$	Our solutions.
{-2, 3}	Solution set presented.

Check: $-x^2 + x + 6 = 0$ $-x^2 + x + 6 = 0$

$-(-2)^2 + (-2) + 6 = 0$ $-(3)^2 + 3 + 6 = 0$

$-4 – 2 + 6 = 0$ $-9 + 3 + 6 = 0$

$-6 + 6 = 0$ $-6 + 6 = 0$

$0 = 0$ $0 = 0$

#47 pg 646: Solve using **Quadratic Formula**

$3y^2 + 2y – 4 = 0$	$a = 3$, $b = 2$, $c = -4$ **Discriminant** is $b^2 – 4ac$ which is $2^2 – 4(3)(-4) = 52$ so we have two real solutions.
$y = \frac{-(2) \pm \sqrt{[2^2 – 4(3)(-4)]}}{2(3)}$	All values put into the formula in parenthesis.
$y = \frac{-2 \pm \sqrt{[4 + 48]}}{6}$	Simplification begins.
$y = \frac{-2 \pm \sqrt{[52]}}{}$	Need to simplify the radical next: $52 = 4 \cdot 13$

$$y = \frac{-2 \pm 2\sqrt{13}}{6}$$ Both terms in the top and 6 have a factor of 2 which can be canceled out.

$$y = \frac{-1 \pm \sqrt{13}}{3}$$ This is our solution set in radical form.

{.869, -1.535} Our solution set presented as decimal approximations.

Using the Quadratic Formula will work on all types of quadratic equations, but factoring is quicker and easier if it is a possible choice for the equation.