3MI_U3_D6_Solve by factoring Day 1 COMPLETE.notebook

Recall:

A quadratic equation:
- Is any equation with a squared variable.
- There is only one variable in the equation.
- To SOLVE it, you need to find the VALUE(S) for the VARIABLE that make(s) the equation true.
- The solutions are called the *roots* of the equation.

To SOLVE a quadratic equation by factoring…
- ✔ Rewrite the equation in standard form (ie. $ax^2 + bx + c = 0$).
- ✔ Factor the quadratic.
- 3. Solve each factor as a linear equation (ie. Let each factor equal zero and then solve - Lesson 2).
- ✔ These values are your solutions to the quadratic equation.
- ✔ To check, substitute the solution(s) back into the equation and make sure the equation "checks".

Example 1: Solve each of the following by factoring.

a) $x^2 - 2x - 24 = 0$

$(x-6)(x+4) = 0$ (2)

$\rightarrow x+4 = 0$ (3)
$x - 6 = 0$ $x = -4$
$x = 6$ (4)

Check: $x = 6$ check $x = -4$
L.S. | R.S   L.S: | R.S
$= (6)^2 - 2(6) - 24 = 0$ $= (-4)^2 - 2(-4) - 24$ = 0
$= 0$ L.S = R.S $= 0$ L.S = R.S.   (5)

b) $9x^2 - 25 = 0$

$(3x + 5)(3x - 5) = 0$

$3x + 5 = 0$ $3x - 5 = 0$
$\frac{3x}{3} = \frac{-5}{3}$ $\frac{3x}{3} = \frac{5}{3}$
$x = -\frac{5}{3}$ $x = \frac{5}{3}$

c) $4x^2 + 20x = -25$

$4x^2 + 20x + 25 = 0$ $\times 100$ $+20$

$\dfrac{(4x + 10)(4x + 10)}{4} = 0$

$\dfrac{2(2x+5)(2)(2x+5)}{4} = 0$

$(2x+5)(2x+5) = 0$

$2x + 5 = 0$ $2x + 5 = 0$
$2x = -5$ $2x = -5$
$x = -\frac{5}{2}$ $x = -\frac{5}{2}$

Check: $x = -\frac{5}{2}$

$\dfrac{L.S}{} \qquad \Big| \quad \dfrac{R.S.}{}$
$= 4\left(-\frac{5}{2}\right)^2 + \overset{10}{20}\left(-\frac{5}{2}\right) \Big| = -25$
$= \frac{4}{1}\left(\frac{25}{4}\right) - 50$
$= 25 - 50$
$= -25$ L.S. = R.S.

d) $2x^2(x + 3) = -4x^2(x - 1)$

$2x^3 + 6x^2 = -4x^3 + 4x^2$

$2x^3 + 4x^3 + 6x^2 - 4x^2 = 0$

$6x^3 + 2x^2 = 0$

$2x^2(3x + 1) = 0$

$2x^2 = 0$ $3x + 1 = 0$
$x^2 = \frac{0}{2}$ $3x = -1$
$x^2 = 0$ $x = -\frac{1}{3}$
$x = \sqrt{0}$
$x = 0$

Homework: pg. 161 – 162 #1 – 7 (odds for each)