Factoring Test Review #3 **Tuesday Sept 22, 2015**

Key

Solve by Factoring #1-6

1. $7x^2 = 6 - 19x$

$-2 \times 21 = -42$
$-2 + 21 = 19$

$7x^2 + 19x - 6 = 0$

$7x^2 - 2x + 21x - 6 = 0$

$x(7x-2) + 3(7x-2) = 0$

$(7x-2)(x+3)$

$x = 2/7 \quad x = -3$

2. $15x^2 = 65x - 20$

$-1 \times 12 = 12$
$-1 + -12 = -13$

$\frac{15x^2}{5} - \frac{65x}{5} + \frac{20}{5} = 0$

$5(3x^2 - 13x + 4)$

$3x^2 - 1x - 12x + 4$

$x(3x-1) - 4(3x-1)$

$5(x-4)(3x-1)$

$x = 4, 1/3$

3. $8x^2 = 18$

$\frac{8x^2}{2} - \frac{18}{2} = 0$

$2(4x^2 - 9) = 0$

$6 \times -6 = -36$
$6 + -6 = 0$

$4x^2 + 0x - 9 = 0$

$4x^2 + 6x - 6x - 9 = 0$

$2x(2x+3) - 3(2x+3)$

$2(2x+3)(2x-3)$

$x = -3/2, 3/2$

4. $12x^2 = 30x$

$\frac{12x^2}{6x} - \frac{30x}{6x} = 0$

$6x(2x-5)$

$x = 0, x = 5/2$

5. $12x^2 - 10 = -26x$

10, 3
15, 2

$15 \times -2 = -30$
$15 + -2 = 13$

$\frac{12x^2}{2} + \frac{26x}{2} - \frac{10}{2} = 0$

$2(6x^2 + 13x - 5) = 0$

$6x^2 + 15x - 2x - 5$

$3x(2x+5) - 1(2x+5)$

$(2x+5)(3x-1)$

$x = -5/2 \quad x = 1/3$

6. $9x^2 - 9 = 72$

$9x^2 - 9 - 72 = 0$

$\frac{9x^2}{9} - \frac{81}{9} = 0$

$9(x^2 - 9) = 0$

$3 \times -3 = -9$
$3 + -3 = 0$

$9(x^2 + 0x - 9) = 0$

$x^2 + 3x - 3x - 9$

$x(x+3) - 3(x+3)$

$(x+3)(x-3)$

$x = -3, x = 3$

For #7 – 10, solve by completing the square

7. $6x^2 = 10x + 2x + 63 + 3$

$\frac{6x^2}{6} - \frac{12x}{6} - \frac{66}{6} = \frac{0}{6}$

$x^2 - 2x - 11 = 0$

$x^2 - 2x + \underline{1} = 11 + \underline{1}$

$(x-1)^2 = 12$

$\sqrt{(x-1)^2} = \pm\sqrt{12}$

$x - 1 = \pm\sqrt{12}$

$\left(\frac{b}{2}\right)^2 = \left(\frac{2}{2}\right)^2 = 1$

$x = 1 \pm \sqrt{12}$ or $x = 1 \pm 2\sqrt{3}$

8. $6x^2 - 12x - 41 = 1$

$\frac{6x^2}{6} - \frac{12x}{6} - \frac{42}{6} = \frac{0}{6}$

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

$x^2 - 2x + \underline{1} = 7 + \underline{1}$

$(x-1)^2 = 8$

$\sqrt{(x-1)^2} = \pm\sqrt{8}$

$x - 1 = \pm\sqrt{8}$

$\left(\frac{b}{2}\right)^2 = \left(\frac{-2}{2}\right)^2 = 1$

$x - 1 = \pm\sqrt{8}$

$x = 1 \pm \sqrt{8}$ or $x = 1 \pm 2\sqrt{2}$

9. $x^2 - 13 = 12x - 1$

$x^2 - 12x - 12 = 0$

$x^2 - 12x + \underline{36} = 12 + \underline{36}$

$(x-6)^2 = 48$

$\sqrt{(x-6)^2} = \pm\sqrt{48}$

$x - 6 = \pm\sqrt{48}$

$\left(\frac{b}{2}\right)^2 = \left(\frac{12}{2}\right)^2 = 6^2 = 36$

$x = 6 \pm \sqrt{48}$ or $x = 6 \pm 4\sqrt{3}$

10. $2x^2 = 16x + 26$

$\frac{2x^2}{2} - \frac{16x}{2} - \frac{26}{2} = \frac{0}{2}$

$x^2 - 8x - 13 = 0$

$x^2 - 8x + \underline{16} = 13 + \underline{16}$

$(x-4)^2 = 29$

$\sqrt{(x-4)^2} = \pm\sqrt{29}$

$\left(\frac{b}{2}\right)^2 = \left(\frac{-8}{2}\right)^2 = 4^2 = 16$

$x - 4 = \pm\sqrt{29}$

Use quadratic equation and discriminant to solve: Quadratic Equation: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

11. Use quadratic formula to solve: $4x^2 = 1x - 6$

$4x^2 - 1x + 6 = 0$ $\quad a = 4$, $b = -1$, $c = 6$

$D = 1^2 - (4 \cdot 4 \cdot 6) = -95$

$x = \frac{1 \pm \sqrt{-95}}{2(4)} = \frac{1 \pm \sqrt{-95}}{8}$

Discriminant -95

Nature of solution: No Real (2 imaginary solutions)

Solution(s) $\frac{1 \pm \sqrt{-95}}{8}$

12. Use quadratic formula to solve: $3x^2 + 1 - x = 5x + 9$

$3x^2 - 6x - 8 = 0$ $\quad a = 3$, $b = -6$, $c = -8$

$D = 6^2 - (4 \cdot 3 \cdot -8) = 132$

$x = \frac{6 \pm \sqrt{132}}{2(3)} = \frac{6 \pm \sqrt{132}}{6}$

Discriminant 132

Nature of solution: 2 Real

Solution(s) $\frac{6 \pm \sqrt{132}}{6}$