Optional Extra Review for Test #10 - Quadratic Equations

Name: _____ Class: _____

1.) Solve the following quadratic equation.

$(2x+7)(5x-4)=0$

$2x+7=0$ | $5x-4=0$

$2x=-7$ | $5x=4$

$x=-7/2$ | $x=4/5$

$\{-7/2, 4/5\}$

2.) Solve the following quadratic equation using the quadratic formula. Express the answer in simplest radical form.

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

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

$x=\frac{-6\pm\sqrt{6^2-4(3)(-3)}}{2(3)}$

$x=\frac{-6\pm\sqrt{72}}{6}$

$x=\frac{-6\pm\sqrt{36}\sqrt{2}}{6}$

$x=\frac{-6\pm6\sqrt{2}}{6}$

$\{-1+\sqrt{2}, -1-\sqrt{2}\}$

3.) Find a quadratic equation, using the variable x, that has a solution of $\{5,-4\}$

$(x-5)(x+4)=0$

$x^2+4x-5x-20=0$

$x^2-x-20=0$

4.) Solve for x.

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

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

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

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

$0=2x^2-6x-8$

$0=2(x^2-3x-4)$

$0=2(x-4)(x+1)$

$\{4,-1\}$

5.) Complete the square: $x^2+\frac{3}{4}x$

$\left(\frac{\frac{3}{4}}{2}\right)^2=\left(\frac{3}{8}\right)^2=\frac{9}{64}$

6.) Solve for all values of x by factoring.

$5x^2=12x$

$5x^2-12x=0$

$x(5x-12)=0$

$x=0$ | $5x-12=0$

$5x=12$

$x=12/5$

$\{0, 12/5\}$

7.) Solve for all values of x by completing the square. Express the answer in simplest radical form.

$4x^2 = -8x + 56$

$4x^2 + 8x = 56$

$x^2 + 2x + 1 = 14 + 1$

$(x+1)^2 = 15$

$x + 1 = \pm\sqrt{15}$

$x = -1 \pm \sqrt{15}$

$\{-1+\sqrt{15}, -1-\sqrt{15}\}$

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

8.) Solve the following quadratic equation using all three methods.

$3x^2 - 2x - 1 = 0$

Factoring	Completing the Square	Quadratic Formula
$(3x+1)(x-1)=0$ $\{-\frac{1}{3}, 1\}$	$3x^2 - 2x = 1$ $x^2 - \frac{2}{3}x = \frac{1}{3}$ $\left(\frac{-\frac{2}{3}}{2}\right)^2 = \left(-\frac{2}{6}\right)^2 = \left(-\frac{1}{3}\right)^2 = \frac{1}{9}$ $x^2 - \frac{2}{3}x + \frac{1}{9} = \frac{1}{3} + \frac{1}{9}$ $(x-\frac{1}{3})^2 = \frac{4}{9}$ $x - \frac{1}{3} = \pm\frac{2}{3}$ $x = \frac{1}{3} \pm \frac{2}{3}$ $\frac{1}{3}+\frac{2}{3}=1$ $\quad$ $\frac{1}{3}-\frac{2}{3}=-\frac{1}{3}$	$3x^2 - 2x - 1 = 0$ $x = \frac{2 \pm \sqrt{(-2)^2 - 4(3)(-1)}}{2(3)}$ $x = \frac{2 \pm \sqrt{4+12}}{6}$ $x = \frac{2 \pm \sqrt{16}}{6}$ $x = \frac{2 \pm 4}{6}$ $\frac{2+4}{6} = \frac{6}{6} = 1$ $\quad$ $\frac{2-4}{6} = \frac{-2}{6} = -\frac{1}{3}$ $\{1, -\frac{1}{3}\}$

9.) Find three positive consecutive odd integers such that the sum of their squares is 371.

Let 1st int $= x = 9$

Let 2nd int $= x+2 = 11$

Let 3rd int $= x+4 = 13$

$x^2 + (x+2)^2 + (x+4)^2 = 371$

$x^2 + x^2 + 4x + 4 + x^2 + 8x + 16 = 371$

$3x^2 + 12x + 20 = 371$

$3x^2 + 12x - 351 = 0$

$3(x^2 + 4x - 117) = 0$

$3(x+13)(x-9) = 0$

$x = -13$

$x = 9$

117: $1 \cdot 117$, $3 \cdot 39$, $9 \cdot 13$