Algebra
Math 06

Name: Solutions Date:

Take Home Quiz # 3

- Justify and show the means by which you arrive at your answers using equations, pictures, calculations, geometry, algebra steps, and/or technology. *You will not receive full credit if your answer is not supported by work that is legible and organized.*
- Place a box around your final answer. *It won't be graded if you do not do this!*
- Make your answers and their presentation in a professional and easily understandable format ... make this your clearest and best work! *Points will be deducted for disorganized, sloppy work.*

9.1 (And Factoring Review)

1. Solve using the "ac" method: $2x^2 - 3x - 2 = 0$

$ac = 2 \cdot -2 = -4$

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

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

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

$x-2=0$ $\quad 2x+1=0$

$\boxed{x=2 \quad x=-\frac{1}{2}}$

Solve using the principle of square roots. Write your answer in simplest radical form.

2. $\sqrt{(2x+3)^2} = \sqrt{20}$

$2x+3 = \pm\sqrt{20}$

$2x+3 = \pm 2\sqrt{5}$

$2x = -3 \pm 2\sqrt{5}$

$\boxed{x = \frac{-3 \pm 2\sqrt{5}}{2}}$

3. $6x^2 + 60 = 6$

$-60 \quad -60$

$\frac{6x^2}{6} = \frac{-54}{6}$

$\sqrt{x^2} = \sqrt{-9}$

$\boxed{x = \pm 3i}$

9.2

Solve the quadratic equation by completing the square:

4. $x^2 + 8x - 5 = 0$

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

$x^2 + 8x + 16 = 5 + 16$

$(x+4)^2 = 21$

$x+4 = \pm\sqrt{21}$

$x = -4 \pm \sqrt{21}$

$\boxed{x = -4 \pm \sqrt{21}}$

5. $2x^2 + 3x - 4 = 0$

$\left(\frac{1}{2}\cdot\frac{3}{2}\right)^2 = \left(\frac{3}{4}\right)^2 = \frac{9}{16}$

$\frac{2x^2+3x}{2} = \frac{4}{2}$

$x^2 + \frac{3}{2}x + \frac{9}{16} = \frac{4}{2} + \frac{9}{16}$

$\sqrt{\left(x+\frac{3}{4}\right)^2} = \sqrt{\frac{41}{16}}$

$x + \frac{3}{4} = \frac{\pm\sqrt{41}}{4}$

$x = \frac{-3}{4} \pm \frac{\sqrt{41}}{4}$

$$x = \frac{-3 \pm \sqrt{41}}{4}$$

9.3

Solve using the quadratic formula:

6. $5x^2 + 6x - 8 = 0$

$x = \frac{-6 \pm \sqrt{6^2 - 4(5)(-8)}}{2(5)}$

$= \frac{-6 \pm \sqrt{196}}{10}$

$= \frac{-6 \pm 14}{10}$

$\frac{-6+14}{10} = \frac{8}{10} = \frac{4}{5}$

$\frac{-6-14}{10} = \frac{-20}{10} = -2$

7. $2x(x+4) = 3x - 3$

$2x^2 + 8x = 3x - 3$

$2x^2 + 5x + 3 = 0$

$x = \frac{-5 \pm \sqrt{5^2 - 4(2)(3)}}{2(2)}$

$x = \frac{-5 \pm 1}{4}$

$\frac{-5+1}{4} = -1$

$\frac{-5-1}{4} = \frac{-3}{2}$

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

8. $\left(\frac{x^2}{3} - x - \frac{1}{6} = 0\right)6$

$2x^2 - 6x - 1 = 0$

$x = \frac{6 \pm \sqrt{6^2 - 4(2)(-1)}}{2(2)}$

$x = \frac{6 \pm \sqrt{44}}{4}$

$x = \frac{6 \pm 2\sqrt{11}}{4} = \frac{3 \pm \sqrt{11}}{2}$