Unit 2B Day 03 HW: Solving Quadratics Using the Quadratic Formula Name Master G

FYI ★ I would solve these by Factoring, Completing the Square or Square roots Date Block

1-9: Solve each quadratic using the quadratic formula. Write irrational answers in simplified radical form.

F ★ 1. $7x^2 - 5x = 0$

$x = \frac{5 \pm \sqrt{25-4(0)}}{14}$

$\frac{5+\sqrt{25}}{14} = \frac{10}{14} = \frac{5}{7}$

$\frac{5-\sqrt{25}}{14} = \frac{0}{14} = 0$

$\{0, \frac{5}{7}\}$

F or S ★ 2. $4x^2 - 9 = 0$

$\frac{0 \pm \sqrt{0-4(-36)}}{8}$

$= \frac{\pm\sqrt{144}}{8}$

$\frac{12}{8}$ & $\frac{-12}{8}$

$\{\pm\frac{3}{2}\}$

3. $3x^2 + 8x = 3$ $3x^2+8x-3=0$

$x = \frac{-8 \pm \sqrt{64-4(-9)}}{6}$

$\frac{-8 \pm \sqrt{100}}{6}$

$\frac{-8+10}{6} = \frac{2}{6}$ $\frac{-8-10}{6} = \frac{-18}{6} = -3$

$\{-3, \frac{1}{3}\}$

4. $25x^2 - 20x - 6 = 0$

$x = \frac{20 \pm \sqrt{400-4(-150)}}{50}$

$\frac{20 \pm \sqrt{1000}}{50}$ $\sqrt{1000}$ $\sqrt{100}\sqrt{10}$

$\frac{20 \pm 10\sqrt{10}}{50} = \frac{2 \pm \sqrt{10}}{5}$

C ★ 5. $x^2 = 4x - 15$ $x^2-4x+15=0$

$x = \frac{4 \pm \sqrt{16-4(15)}}{2}$

$\frac{4 \pm \sqrt{-44}}{2}$

$\frac{4 \pm 2i\sqrt{11}}{2} = 2 \pm i\sqrt{11}$

6. $7x^2 + 6x + 2 = 0$

$x = \frac{-6 \pm \sqrt{36-4(14)}}{14}$

$\frac{-6 \pm \sqrt{-20}}{14}$

$\frac{-6 \pm 2i\sqrt{5}}{14} = \frac{-3 \pm i\sqrt{5}}{7}$

7. $6x^2 - 2x = 1$ $6x^2-2x-1=0$

$x = \frac{2 \pm \sqrt{4-4(-6)}}{12}$

$\frac{2 \pm \sqrt{28}}{12}$

$\frac{2 \pm 2\sqrt{7}}{12} = \frac{1 \pm \sqrt{7}}{6}$

8. $16x^2 - 8x + 1 = 0$

$x = \frac{8 \pm \sqrt{64-4(16)}}{32}$

$\frac{8 \pm \sqrt{0}}{32}$

$= \frac{8}{32} = \frac{1}{4}$ double root

S ★ 9. $3x^2 + 36 = 0$

$x = \frac{0 \pm \sqrt{0-4(108)}}{6}$

$\frac{\pm\sqrt{-432}}{6} = i\sqrt{16 \cdot 9 \cdot 3}$

$i \cdot 4 \cdot 3\sqrt{3}$

$\frac{\pm 12i\sqrt{3}}{6} = \pm 2i\sqrt{3}$

10-13: Find the value of the discriminant and describe the number and type of roots. DO NOT SOLVE!

10. $9x^2 - 6x + 1 = 0$

$36-4(9)$

0: double root

11. $x^2 + 12x = -4$

$x^2+12x+4=0$

$144-4(4)$

128: 2 real irrational roots

12. $4x^2 - 4x + 11 = 0$

$16-4(44)$

-160: 2 complex imaginary roots

13. $2x^2 - 7x - 4 = 0$

$49-4(-8)$

81: 2 real rational roots

14. GRAVITATION – *YOU MUST SOLVE THIS ALGEBRAICALLY!*

The height h(t) in feet of an object t seconds after it is propelled straight up from the ground with an initial velocity of 60 feet per second is modeled by the equation $h(t) = -16t^2 + 60t$. At what times will the object be at a height of 56 feet?

$56 = -16t^2 + 60t \rightarrow 16t^2 - 60t + 56 = 0$

$\frac{60 \pm \sqrt{3600-4(896)}}{32} = \frac{60 \pm \sqrt{16}}{32}$

$\frac{60+4}{32} = \frac{64}{32} = 2$ $\frac{60-4}{32} = \frac{56}{32} = 1.75$

at 1.75 & 2 seconds