7. Algebra 1: Quadratic Equations
Assignment   MRS. WILSON

1. Simplify $\sqrt{81}$

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2. Simplify $\sqrt{\frac{16}{121}}$

$\dfrac{4}{11}$

3. Solve:

$$4x^2 - 64 = 0$$

$+64 \quad +64$

$\dfrac{4x^2}{4} = \dfrac{64}{4}$

$\sqrt{x^2} = \sqrt{16} \quad x = \pm 4$

4. Solve:

$$5x^2 + 10 = 135$$

$-10 \quad -10$

$\dfrac{5x^2}{5} = \dfrac{125}{5}$

$\sqrt{x^2} = \sqrt{25} \quad x = \pm 5$

5. Solve for x.

$$\sqrt{(x-4)^2} = \sqrt{36}$$

$x - 4 = \pm 6$

$\begin{array}{ll} x-4=6 & x-4=-6 \\ +4 \quad +4 & +4 \quad +4 \end{array}$

$\boxed{x=1} \qquad \boxed{x=-2}$

6. Solve for x.

$$(x+4)^2 + 4 = 40$$

$-4 \quad -4$

$(x+4)^2 = 36$

$x+4 = \pm 6$

$\begin{array}{ll} x+4=6 & x+4=-6 \\ -4 \quad -4 & -4 \quad -4 \end{array}$

$\boxed{x=2} \qquad \boxed{x=-10}$

7. Solve for x.

$$x^2 + 12x + 32 = 0$$

$\dfrac{8 \quad 32/4}{x \quad 12 \quad x}$

$\begin{array}{ll} x+8=0 & x+4=0 \\ -8 \quad -8 & -4 \quad -4 \end{array}$

$\boxed{x=-8} \qquad \boxed{x=-4}$

8. Solve for x.

$$x^2 + 7x - 8 = 0$$

$\dfrac{-8}{8 \quad -1}{x \quad 7 \quad x}$

$\begin{array}{ll} x+8=0 & x-1=0 \\ -8 \quad -8 & +1 \quad +1 \end{array}$

$\boxed{x=-8} \qquad \boxed{x=1}$

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9. Solve for x.

$$3x^2 - 11x + 6 = 0$$

$\dfrac{-9 \quad 18 \quad -2}{3x \quad -11 \quad x}$

$\begin{array}{ll} 3x-9=0 & 3x-2=0 \\ +9 \quad +9 & +2 \quad +2 \end{array}$

$\dfrac{3x}{3} = \dfrac{9}{3} \quad \boxed{x=3} \qquad \dfrac{3x}{3} = \dfrac{2}{3} \quad x = \dfrac{2}{3}$

10. Solve for x.

$$3x^2 - 75 = 0$$

$+75 \quad +75$

$\dfrac{3x^2}{3} = \dfrac{75}{3}$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

$$\frac{1}{3} \quad \frac{1}{3}|x-1| \quad x = \frac{9}{3}$$

$$x = \pm 5$$

11. Describe the number of solutions: b^2-4ac

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

$a=1 \quad b=-7 \quad c=7$

$(-7)^2 - 4(1)(7)$

$49 - 28$

21 **2 SOLUTIONS**

12. Describe the number of solutions: b^2-4ac

$$x^2 + 8x + 16 = 0$$

$a=1 \quad b=8 \quad c=16$

$8^2 - 4(1)(16)$

$64 - 64$

0 **1 SOLUTIONS**

13. Solve by completing the square. Fill in Step 2 and Step 3.

$$x^2 - 14x - 15 = 0$$

Step 1	$x^2 - 14x + \underline{49} = +15 + \underline{49}$
Step 2	$(\underline{x-7})^2 = \underline{64}$
Step 3	$\underline{x-7} = \pm\ \underline{8}$
Step 4	$x = -1$ and $x = 15$

14. Solve by using the quadratic formula. Fill in Step 2.

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

Step 1	$x = \dfrac{-(6) \pm \sqrt{(6)^2 - 4(1)(-6)}}{2(1)}$
Step 2	$x = \dfrac{-6 \pm \sqrt{36} + (24)}{2}$
Step 3	$x = \dfrac{-6 \pm \sqrt{60}}{2}$

Free Response

15. A model rocket is fired vertically into the air at $54\ m/s$. The expression $-9t^2 + 54t$ gives the rocket's height after t seconds. Find the number of seconds it takes for the rocket to reach the ground. $h=0$

$h = -9T^2 + 54T$

$0 = -9T(T-6)$

$T - 6 = 0$

$+6\ \ +6$

$T = 6$ seconds for the rocket to reach the ground.

16. A landscaper is designing a rectangular brick patio. She has enough bricks to cover 65 square feet. She wants the length of the patio to be 8 feet longer than the width. What dimensions should she use for the patio?

$65 = W(W+8)$

$65 = W^2 + 8W$

$-65 -65$

$0 = W^2 + 8W - 65$

$\dfrac{-65}{13} \diagdown 8 \diagdown \dfrac{-5}{W} $

$13/W \quad 8 \quad -5/W$

$W - 5 = 0$

$+5\ \ +5$

$\boxed{W = 5}$

$L = 8 + 5 = 13$

17. An artist is working on a rectangular painting with a length that is 4 inches longer than its width. The area of the painting is 60 square inches. What is the length and width of the painting?

$60 = W(W+4)$

$60 = W^2 + 4W - 60$

-60

$0 = W^2 + 4W - 60$

$\dfrac{-60}{10} \diagdown \dfrac{-6}{W} $

$10/W \quad 4 \quad -6/W$

$W - 6 = 0$

$+6\ \ +6$

$\boxed{W = 6}$

$L = 6 + 4$

$\boxed{L = 10}$