Unit 5 Radical Functions Review

Name: Key

Date: _____ Period: _____

Lesson 3: Solving Equations

Solve the following equations. Check for extraneous solutions. If a solution is extraneous explain why.

15. $\sqrt{x} - 6 = 2$

$+6 \quad +6$

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

$x = 64$

$\sqrt{64} - 6 = 2$

$8 - 6 = 2$ ✓

16. $\sqrt{5x-6} - \sqrt{2x+9} = 0$

$+\sqrt{2x+9} \quad +\sqrt{2x+9}$

$(\sqrt{5x-6})^2 = (\sqrt{2x+9})^2$

$5x - 6 = 2x + 9$

$-2x \quad -2x$

$3x - 6 = 9$

$+6 \quad +6$

$\frac{3x}{3} = \frac{15}{3}$

$x = 5$ ✓

$\sqrt{25-6} - \sqrt{10+9} = 0$

$\sqrt{19} - \sqrt{19} = 0$

$0 = 0$

17. $\sqrt{x+2} - 2 = x$

$+2 \quad +2$

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

$x + 2 = x^2 + 4x + 4$

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

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

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

$\sqrt{-2+2} - 2 = -2$

$0 - 2 = -2$ ✓

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

$1 - 2 = -1$ ✓

$-1 = -1$

Solve the following equations. Check for extraneous solutions.

18. $x^{\frac{2}{3}} - 2 = 7$

$\sqrt[3]{x}^2 - 2 = 7$

$+2 \quad +2$

$\sqrt{\sqrt[3]{x}^2} = \sqrt{9}$

$\sqrt[3]{x}^3 = 3^3$

$x = 27$

19. $x^{\frac{1}{4}} = 5$

$(\sqrt[4]{x})^4 = 5^4$

$x = 625$

20. $-2x^{\frac{3}{2}} = 16$

$\frac{-2\sqrt{x}^3}{-2} = \frac{16}{-2}$

$\sqrt[3]{\sqrt{x}^3} = \sqrt[3]{8}$

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

$x = 4$ ← Extraneous Solution

21. $(x+3)^{\frac{2}{3}} = 4$

$\sqrt{\sqrt[3]{x+3}}^2 = \sqrt{4}$

$(\sqrt[3]{x+3})^3 = 2^3$

$x + 3 = 8$

$-3 \quad -3$

$x = 5$

22. $(5x)^2 = (\sqrt{8 + 10x})^2$

$25x^2 = 8 + 10x$

$25x^2 - 10x - 8 = 0$

$x^2 - 10x - 200$

$(x - \frac{20}{25})(x + \frac{10}{25})$

$(x - 4/5)(x + \frac{2}{5})$

$x = 4/5 \quad x = -2/5$

Extraneous Solution

23. Write the exponential expression $9x^{\frac{9}{10}}$ in radical form.

$(\sqrt[10]{9x})^9$

24. Let $f(x) = -3x - 6$ and $g(x) = 5x + 2$. Find the following...

a) $f(x) + g(x)$

$-3x - 6 + 5x + 2$

$2x - 4$

b) $f(x) - g(x)$

$-3x - 6 - 5x - 2$

$-8x - 8$

c) $f \cdot g$

$(-3x-6)(5x+2)$

$-15x^2 - 6x$

$-30x - 12$

$-15x^2 - 36x - 12$

d) $\frac{f}{g}$

$\boxed{\frac{-3x-6}{5x+2}}$