Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Rationals & Radicals Study Guide

1. Solve. $\frac{x-3}{x-1} = \frac{x-6}{x+2}$

2. Solve. $\frac{4}{x^2-6x+5} = \frac{1}{x^2-25}$

Simplify the rational expression. Include excluded values.

3. $\frac{x^2+4x+3}{x^2-9}$

a. $\frac{4x+1}{-3}$
b. $\frac{x+1}{x-3}$
c. $\frac{x+3}{x-3}$
d. $\frac{x+4}{x-9}$
e. $x \neq -3$
f. $x \neq -1$
g. $x \neq 3$
h. 9

4. $\frac{x^2-5x}{x+4} \cdot \frac{x+4}{x^2-7x}$

a. $\frac{5}{7}$
b. $\frac{x^2-5}{x^2-7}$
c. $\frac{x-5}{x-7}$
d. $\frac{x+5}{x+7}$
e. $x \neq -4$
f. $x \neq 7$
g. $x \neq 0$
h. $x \neq 5$

5. $\frac{(x-2)(x-5)}{x-4} \div \frac{(x-2)}{(x-1)(x-4)}$

a. $\frac{x-5}{x-1}$
b. $\frac{(x-1)}{(x-5)}$
c. $\frac{(x-2)^2(x-5)}{(x-4)^2(x-1)}$
d. $(x-1)(x-5)$
e. $x \neq 5$
f. $x \neq 1$
g. $x \neq 4$
h. $x \neq 2$

6. $\frac{x^2+5x+20}{x-4} - \frac{-3x+5}{x-4}$

a. $\frac{x^2+8x+15}{x-4}$
b. $\frac{x^2+4x+14}{x-4}$
c. $\frac{x+5}{x-4}$
d. $x+5$

7. Solve the equation $\frac{x^2-9}{2x} = \frac{3x+3}{6}$.

a. $x = 3, -3$
b. $x = 4$
c. $x = -9$
d. $x = 0$

8. Solve the equation $\frac{2}{x-5} = \frac{7}{x}$.

a. $x = 7$
b. $x = -7$
c. $x = 5$
d. $x = \frac{7}{5}$

9. $x - \frac{6}{x} = 1$

10. Which is the solution of the equation $2\sqrt[3]{x-4}+10=0$?

a. $x=-129$
b. $x=-121$
c. $x=-11$
d. The equation has no solutions.

11. The relationship between the length of a pendulum L (in feet) and its period T (in seconds) is modeled by the equation $T=2\pi\sqrt{\frac{L}{32}}$. To the nearest foot, which is the length of a pendulum with period 5 seconds?

a. 17 feet
b. 20 feet
c. 23 feet
d. 31 feet

12. Consider the radical equation $x+\sqrt{x}=30$.

a. Solve the equation.

b. Check for extraneous roots.

c. Identify all solutions of the given equation.

13. Which equation(s) have no solution? Select all.

a. $-3\sqrt{3x-7}=-6$
b. $\sqrt{x}-2=0$
c. $(2x-1)^{\frac{1}{2}}+8=16$
d. $\sqrt{x+2}+4=1$

14. Which of the following are equivalent? Select all.

a. $\left(\sqrt[4]{x}\right)^3$
b. $x^{\frac{3}{4}}$
c. $x^{\frac{4}{3}}$
d. $\sqrt[4]{x^3}$

15. Simplify. $\sqrt[3]{16x^4y^7}$

16. Write $\sqrt[3]{27a^6b^7}$ with fraction exponents.

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Answer Section

1. 2
2. x=-7
3. B, E, G
4. C, E, F, G
5. D, F, G, H
6. A
7. C
8. A
9. -2, 3
10. B
11. B
12. **a.** $x + \sqrt{x} = 30$

$\sqrt{x} = -x + 30$

$(\sqrt{x})^2 = (-x + 30)^2$

$x = x^2 - 60x + 900$

$0 = x^2 - 61x + 900$

$0 = (x - 25)(x - 36)$

$x - 25 = 0 \text{ or } x - 36 = 0$

$x = 25 \text{ or } \quad x = 36$

b.

$x = 25$:

$25 + \sqrt{(25)} \stackrel{?}{=} 30$

$25 + 5 \stackrel{?}{=} 30$

$30 = 30$

$x = 36$:

$36 + \sqrt{(36)} \stackrel{?}{=} 30$

$36 + 6 \stackrel{?}{=} 30$

$42 \neq 30$

c. The equation has one solution, $x = 25$.

13. D
14. A, B, D
15. $2xy^2\sqrt[3]{2xy}$
16. $3a^2b^{\frac{7}{3}}$