

MATH 70 TEST 4 First and Last Name: _____

CHAPTERS 7–8

SPRING 2011

DIRECTIONS: No calculators may be used. Be sure to *show ALL of your work*. Depending on the problem, you may receive **NO CREDIT** if no work is shown even if the answer is correct. Don't take that chance. If your answer is a fraction, reduce it to lowest terms. If there is a blank, write your answer in the blank, otherwise **circle your answer**. Once the test is returned, the **KEY** will be on reserve at the library. Use the key to check and correct your work. Keep this test to study from for the final exam.

For problem 1 find the indicated roots. If the root is not a real number, write "not real."

1. a. $\sqrt{-25}$ _____
 b. $\sqrt[3]{-64}$ _____
 c. $\sqrt[4]{16}$ _____
 d. $\sqrt{121}$ _____
 e. $\sqrt[4]{-16}$ _____

For problems 2 through 5 simplify each radical expression. Give your answer in proper form.

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

3. $\sqrt[3]{32x^{12}}$

$$4. \frac{\sqrt{6}}{3 - \sqrt{2}}$$

$$5. 3\sqrt{18} - 10\sqrt{72}$$

Radical Expressions and Equations: For problems 6 through 10, if the problem is a rational expression, simplify it; if it is a rational equation, solve it.

$$6. \frac{x^2 - 36}{x^2 + 3x - 18} \div \frac{x^2 - 10x + 24}{x^2 - 6x + 9}$$

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

8. $\frac{3}{m+1} - \frac{4}{m}$

9. $\frac{6}{x+1} + \frac{x}{x-4} = \frac{-30}{x^2 - 3x - 4}$

10. $\frac{20 + \frac{5}{x}}{5 - \frac{30}{x}}$

SOLVE the following radical equations.

11. $\sqrt{x-2} + 5 = 3$

12. $\sqrt{x+20} = \sqrt{x} + 2$

SIMPLIFY the following expressions containing fractional exponents as far as possible. Your answer should be a number with no exponent.

13. $49^{\frac{1}{2}}$

14. $64^{-\frac{5}{3}}$

15. $\frac{2^{-\frac{3}{5}} 2^{\frac{1}{5}}}{2^{\frac{8}{5}}}$

SOLVE for a specific variable.

16. Solve for b given that $\frac{1}{a} = \frac{1}{b} + \frac{1}{c}$

State where each expression below is undefined.

17. $\frac{x-2}{2x+3}$

18. $\frac{1}{2x^2+10x+12}$

Applications

19. If Anthony can build a K'Nex Roller Coaster in 2 hours working alone, Jacob can build it in 5 hours working alone, and Caleb can build it in 10 hours working alone, how long would it take them to construct the roller coaster if they work together? (Remember to put correct units on your answer.)

20. Kasey can travel 8 miles upstream in the same time it takes her to go 12 miles downstream. Her boat goes 15 miles per hour in still water. What is the rate of the current?