

**UNIT 3: PRACTICE TEST**

1) What is the least common denominator of  $\frac{1}{x}$ ,  $\frac{2}{x^2-6x}$ , and  $\frac{5}{x^2-2x-8}$ ?

$x(x-6) \quad (x-4)(x+2)$

$LCD = x(x-6)(x-4)(x+2)$

2) Simplify:  $\frac{3 \cdot 15x^4y^5}{2 \cdot 10x^2y^2}$

$\frac{3x^2y^3}{2}$

3) When  $\frac{y^2-16}{y^2-7y+12}$  is placed in simplest form, what expression can be found in the denominator?

$\frac{(y+4)(y-4)}{(y-4)(y-3)}$

$y-3$

4) In the expression,  $\frac{25x^2-1}{3x^2-11x-20}$ , x is undefined for which of the following values?

★ FIX

$(5x+1)(5x-1) \quad 3x^2 - 11x - 20 = 0$

$3x^2 - 12x + 5x - 20$

$3x(x-4) + 5(x-4)$

$(3x+5)(x-4)$

$(-5/3) \quad 4$

5) Paul can plant a wheat crop in 8 days. His daughter can do it in 10 days. How many days will it take them if they work together to the nearest tenth?

$40x \left( \frac{1}{8} + \frac{1}{10} = \frac{1}{x} \right)$

$5 \frac{40x}{8} + \frac{40x}{10} = \frac{40x}{x}$

$5x + 4x = 40$

$9x = 40$

$x = 4.4$

6) Solve:  $\sqrt{x^2 - 5x + 5} = 1$

$$x^2 - 5x + 5 = 1$$

$$x^2 - 5x + 4 = 0$$

$$(x-4)(x-1)$$

7) Simplify:  $y \left( \frac{x+\frac{1}{y}}{x} - \frac{1}{y} \right)$

$$xy + x$$

$$y^2 - 1$$

$$\frac{x}{y-1} = \frac{x(y+1)}{(y+1)(y-1)}$$

8) The solution set of the equation  $\sqrt{x+6} + 8 = 0$  is

$$\frac{(\sqrt{x+6})^2 = (-8)^2}{-8-8}$$

NO SOLUTION

9) If the ratio  $\frac{3x^2 + 12x + 4}{x+3}$  is placed in the form  $q(x) + \frac{x+3}{r}$ , where  $q(x)$  is a polynomial, then which of the following is the correct value of  $r$ ?

Remainder Theorem:  $3(-3)^2 + 12(-3) + 4$

$$27 - 36 + 4 = -5$$

$$r = -5$$

10) Multiply:  $(4\sqrt{x}-y)(6\sqrt{x}+y)$

$$24(x) + 4y\sqrt{x} - 6y\sqrt{x} - y^2$$

$$\frac{24x - 2y\sqrt{x} - y^2}{-y^2 + 24x - 2y\sqrt{x}}$$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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**UNIT 3: PRACTICE TEST****PART I- 2pts each**

1) \_\_\_\_\_ 6) \_\_\_\_\_

2) \_\_\_\_\_ 7) \_\_\_\_\_

3) \_\_\_\_\_ 8) \_\_\_\_\_

4) \_\_\_\_\_ 9) \_\_\_\_\_

5) \_\_\_\_\_ 10) \_\_\_\_\_

**PART II: SHOW ALL WORK TO RECEIVE PARTIAL CREDIT. 6 points each**

11) a. Simplify:  $\frac{x^3 - 9x}{x^3 + 2x^2 - 3x} = \frac{x(x-9)}{x(x^2 + 2x - 3)} = \frac{x(x^2 - 9)}{x(x+3)(x-1)}$

$$= \frac{x(x+3)(x-3)}{x(x+3)(x-1)}$$

11a.  $\frac{x-3}{x-1}$

b. Find all values of x that make the fraction undefined.

$$\frac{(x) | (x+3) | (x-1)}{0 | -3 | 1} = 0$$

11b.  $\{-3, 0, 1\}$

12) Solve for x:  $\sqrt[3]{x+5} + 7 = 9$

$$\begin{array}{r} -7 \quad -7 \\ \hline (\sqrt[3]{x+5})^3 = (2)^3 \end{array}$$

$x+5=8$

$x=3$

12.  $x=3$

15) Solve the equation  $\sqrt{4x+5} + x = 4$  algebraically. Justify the solution set.

$$\begin{aligned}
 (x-1)(11-x) &= 0 \\
 x^2 - 12x + 11 &= 0 \\
 \hline
 4x+5 &= x^2 - 8x + 11 \\
 -4x-5 & \quad -4x-5 \\
 \hline
 10 &= 4x - 4x + x^2 + x^2 \\
 (4-x)(4-x) & \\
 (4-x)^2 &= (4-x)^2 \\
 x-x &
 \end{aligned}$$

REJECT

$$\begin{aligned}
 7+11 &= 4 \\
 \sqrt{4 \cdot 9 + 11} &= 4 \\
 7+11 &= 4 \\
 \sqrt{4(1)+5} + 11 &= 4 \\
 4+11 &= 4 \\
 3+1 &= 4 \\
 2+1 &= 4 \\
 x &= 1
 \end{aligned}$$

$$\begin{aligned}
 2x &= -14 \\
 x &= -7
 \end{aligned}$$

$$\begin{aligned}
 2x+8+x &= x-6 \\
 3x+8 &= x-6 \\
 2x+8+x &= x-6 \\
 2(x+4)+x &= x-6
 \end{aligned}$$

14) Solve for x

$$\left( \frac{x}{2} + \frac{x+4}{1} = \frac{x-6}{x-6} \right) \cdot (x(x+4))$$

$$\boxed{x = -7}$$

$$\frac{x^2 - 9}{(x-4)(x+3)} = \frac{x^2 - x - 12}{(x-3)(x+3)}$$

13) Simplify:

$$\frac{x^2 \left(1 - \frac{1}{12} - \frac{1}{x^2}\right)}{x^2 \left(1 - \frac{9}{x^2}\right)} = \frac{x^2 - \frac{x^2}{12} - \frac{x^2}{x^2}}{x^2 - \frac{9x^2}{x^2}} = \frac{x^2 - \frac{x^2}{12} - 1}{x^2 - 9}$$

LCD =  $x^2$

$$\boxed{\frac{x-4}{x-3}}$$