

Review of Rational Expressions

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1. What is the least common denominator of  $\frac{1}{2}$ ,  $\frac{2}{7x}$ , and  $\frac{5}{x^2}$ ? use larger exponent!

LCD =  $\boxed{14x^2}$

2: 4, 6, 8, 10, 12,  $\boxed{14}$   
 7:  $\boxed{14}$

2. The least common denominator of the fractions  $\frac{13}{x}$  and  $\frac{7}{x-2}$  is

- A.  $x - 2$       **B.  $x(x - 2)$**       C.  $x^2 - 2$       D. 91

3. For which value or values of  $n$  is the expression  $\frac{n-1}{2n+4}$  undefined? set denom. = to zero

$2n + 4 = 0$   
 $\frac{2n}{2} = \frac{-4}{2}$   
 $\boxed{n = -2}$

4. The expression  $\frac{14+x}{x^2-4}$  is undefined when  $x$  is

- A. -14, only      B. 2, only      **C. -2 or 2**      D. -14, -2, or 2

$x^2 - 4 = 0$   
 $(x+2)(x-2) = 0$   
 $-2 \quad | \quad 2$

5. Which expression represents  $\frac{-14a^2c^8}{7a^3c^2}$  in simplest form?

- A.  $-2ac^4$   
 B.  $-2ac^6$   
 C.  $\frac{-2c^4}{a}$   
**D.  $\frac{-2c^6}{a}$**

$\frac{-14a^2c^8}{7a^3c^2}$   
 $\frac{-2c^6}{a}$

6. If  $x \neq 0$ , the expression  $\frac{x^2 + 2x}{x}$  is equivalent to

A.  $x^2 + 2$

B.  $x + 2$

C.  $2x$

D.  $2$

$$\frac{\cancel{x}(x+2)}{\cancel{x}}$$

7. Simplify:  $\frac{x^2 + 6x + 5}{x^2 - 25}$

$$\frac{\cancel{(x+5)}(x+1)}{\cancel{(x+5)}(x-5)} = \boxed{\frac{(x+1)}{(x-5)}}$$

~~8. The expression  $\frac{2x^2 + 10x - 25}{4x + 28}$  is equivalent to~~

~~A.  $\frac{x-2}{2}$~~

~~B.  $x-1$~~

~~C.  $\frac{x+2}{2}$~~

~~D.  $\frac{x+5}{2}$~~

~~$2x^2 - 25$~~

~~9. Written in simplest form, the expression  $\frac{x^2 - 9x}{45x - x^2}$  is equivalent to~~

~~$$\frac{\cancel{x}(x-9)}{\cancel{x}(45-x)}$$~~

10. Written in simplest form, the expression  $\frac{x^2y^2 - 9}{3 - xy}$  is equivalent to

$$\frac{(xy+3)\cancel{(xy-3)}}{\cancel{(3-xy)}} = \boxed{\begin{array}{l} -(xy+3) \\ \text{or } -xy-3 \end{array}}$$

11. Simplify:  $\frac{9x^2 - 15xy}{9x^2 - 25y^2}$

$$\frac{3x\cancel{(3x-5y)}}{\cancel{(3x-5y)}(3x+5y)} = \boxed{\frac{3x}{3x+5y}}$$

12. State the restricted value(s) and express in lowest terms:  $\frac{x^2 - 9}{x^2 + 3x}$

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

13. Which of the following expressions is equivalent to the one shown below?

$$\frac{x^2 - 3x}{x^3 + x^2 - 12x} = \frac{x(x-3)}{x(x^2+x-12)} = \frac{x(x-3)}{x(x+4)(x-3)} = \frac{x}{x(x+4)} = \boxed{\frac{1}{x+4}}$$

- A.  $\frac{1}{x+4}$ , where  $x \neq 0, 3, -4$
- B.  $\frac{1}{x+4}$ , where  $x \neq 3, -4$
- C.  $\frac{x}{x+4}$ , where  $x \neq 3, -4$
- D.  $\frac{x}{x+4}$ , where  $x \neq 3, -4$

14. Which expression represents  $\frac{x^2 - x - 6}{x^2 - 5x + 6}$  in simplest form?

- A.  $\frac{x+2}{x-2}$
  - B.  $\frac{-x-6}{-5x+6}$
  - C.  $\frac{1}{5}$
  - D.  $-1$
- $$\frac{(x-3)(x+2)}{(x-3)(x-2)}$$

15. Express in simplest terms: LCD =  $x^2$

$$x^2 \left( \frac{1 + \frac{3}{x}}{1 - \frac{5}{x} - \frac{24}{x^2}} \right) = \frac{x^2 + 3x}{x^2 - 5x - 24} = \frac{x(x+3)}{(x-8)(x+3)} = \boxed{\frac{x}{x-8}}$$

16. Express in simplest form:  $\frac{2d \left( \frac{1}{2} - \frac{4}{d} \right)}{2d \left( \frac{1}{d} + \frac{3}{2d} \right)}$

$$\text{LCD} = 2d \quad \frac{d-8}{2+3} = \boxed{\frac{d-8}{5}}$$

$$LCD = 4x$$

17. Simplify:  $\frac{4x \left( \frac{1}{4} + \frac{1}{4x} \right)}{4x \left( \frac{1}{x} + \frac{1}{4} \right)} = \frac{x+1}{4+x} = \boxed{\frac{x+1}{x+4}}$

$$LCD = x-y$$

18. The expression  $\frac{x-y \left( 1 - \frac{x}{x-y} \right)}{x-y \left( \frac{1}{x-y} \right)}$  is equivalent to

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

A.  $1-x$

B.  $x-y$

C.  $y$

D.  $-y$

$$LCD = x$$

19. Express in simplest form:  $\frac{x \left( \frac{x-4}{x} \right)}{x \left( \frac{2+x}{x} \right)} = \frac{x^2-4}{2+x} = \frac{(x+2)(x-2)}{(x+2)} = \boxed{x-2}$

20. Express in simplest form:  $\frac{r^2 \left( \frac{1}{r} - \frac{1}{s} \right)}{r^2 \left( \frac{r^2}{s^2} - 1 \right)} = \frac{s^2 - rs}{r^3 - rs^2} = \frac{s(s-r)}{r(r^2-s^2)} = \frac{-1 \cdot s \cancel{(s-r)}}{r(r+s)(r-s)} = \boxed{\frac{-s}{r(r+s)}}$