

Rational Expressions Practice Test

Name _____

(Multiple Choice)

1. Find any values for which $\frac{x+5}{x^3-7x^2+12x}$ is undefined.

- (a) 0, 3, 4 (b) 0, -3, -4 (c) 0, 3, 4, -5 (d) 0, -5

2. Find the numerical value of $\frac{x-2}{2x^2-7x-15}$ when $x = -2$.

- (a) 0 (b) $\frac{4}{9}$ (c) $-\frac{4}{7}$ (d) Undefined

3. Find the rational expression equivalent to $-\frac{4-3x}{5x+6}$.

- (a) $\frac{-4-3x}{5x+6}$ (b) $\frac{-4+3x}{-5x-6}$ (c) $\frac{3x-4}{-5x-6}$ (d) $\frac{3x-4}{5x+6}$

For exercises 4 and 5, write the rational expression in lowest terms.

4. $\frac{36c^5d^4}{96cd^8}$

- (a) $\frac{c^4}{3d^4}$ (b) $\frac{3c^4d^4}{8}$ (c) $\frac{c^4d^4}{3}$ (d) $\frac{3c^4}{8d^4}$

5. $\frac{1-w}{w^2-1}$

- (a) $-(w+1)$ (b) $w+1$ (c) $-\frac{1}{w+1}$ (d) $\frac{1}{w+1}$

For exercises 6-8, multiply or divide. Write the answer in lowest terms.

6. $\frac{9(t+d)}{5} \div \frac{10(t+d)}{6}$

- (a) $3\left(\frac{t+d}{5}\right)$ (b) $\frac{27}{27}$ (c) $\frac{27}{25}$ (d) $\frac{27}{25\left(\frac{t+d}{5}\right)}$

$$7. \frac{c^2 + 7c + 10}{c^2 + 2c - 15} \cdot \frac{4c + 12}{3c + 15}$$

$$(a) \frac{4\cancel{c+2}\cancel{c+3}}{3(c-3)(c+5)}$$

$$(b) \frac{4\cancel{c+2}\cancel{c+5}}{3}$$

$$(c) \frac{4\cancel{c+2}\cancel{c+3}}{3\cancel{c-3}}$$

$$(d) \frac{4\cancel{c+2}}{3}$$

$$8. \frac{a^2 - b^2}{2a - 2b} \div \frac{8}{a + b}$$

$$(a) \frac{1}{16}$$

$$(b) \frac{\cancel{a+b}^2}{16}$$

$$(c) \frac{\cancel{a-b}\cancel{a+b}}{16}$$

$$(d) \frac{a+b}{8}$$

For exercises 9-10, find the least common denominator for each list of rational expressions.

$$9. \frac{5}{6ab^3}, \frac{-7}{2a^2}, \frac{9}{4b^2}$$

$$(a) 2a$$

$$(b) 12a^2b^3$$

$$(c) 48a^3b^5$$

$$(d) 24a^3b^3$$

$$10. \frac{x-3}{2x^2-9x+4}, \frac{2x+7}{2x^2+9x-5}$$

$$(a) (2x-1)^2(x-4)(x+5)$$

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

$$(c) (2x-1)(x-4)(x+5)$$

$$(d) 2x-1$$

For exercises 11-12, rewrite each rational expression with the given denominator.

$$11. \frac{9}{7z^3} = \frac{\quad}{63z^{12}}$$

$$(a) \frac{18z^9}{63z^{12}}$$

$$(b) \frac{81z^9}{63z^{12}}$$

$$(c) \frac{18z^4}{63z^{12}}$$

$$(d) \frac{81z^4}{63z^{12}}$$

$$12. \frac{8}{4p+16} = \frac{\quad}{4p^2-64}$$

$$(a) \frac{p+4}{4p^2-64}$$

$$(b) \frac{8p+32}{4p^2-64}$$

$$(c) \frac{p-4}{4p^2-64}$$

$$(d) \frac{8p-32}{4p^2-64}$$

For exercises 13-16, add or subtract. Write each answer in lowest terms.

13. $\frac{3r+1}{r-4} - \frac{r+9}{r-4}$

(a) $\frac{2r+10}{r-4}$

(b) $\frac{4r-8}{r-4}$

(c) $\frac{4r+10}{r-4}$

(d) 2

14. $\frac{t+2}{3t-9} + \frac{3-2t}{5t-15}$

(a) $\frac{19-t}{15(-3)}$

(b) $\frac{15-t}{15(-3)}$

(c) $\frac{3t+8}{15(-3)}$

(d) $\frac{5-t}{8(-3)}$

15. $\frac{3x+2}{4x-5} - \frac{x-1}{5-4x}$

(a) $\frac{x+1}{x-5}$

(b) $\frac{2x+3}{4x-5}$

(c) $\frac{4x+1}{4x-5}$

(d) $\frac{2x+1}{4x-5}$

16. $\frac{r-1}{r^2-r-2} + \frac{r-2}{r^2-4}$

(a) $\frac{2r^2-4}{(-2)(+2)(+1)}$

(b) $r-1$

(c) $\frac{2}{r+1}$

(d) $\frac{2}{(+2)(+1)}$

For exercises 17-18, simplify the complex fraction.

17. $\frac{\frac{3-t}{6}}{\frac{9-t^2}{15}}$

(a) $\frac{5}{2(+t)}$

(b) $\frac{5}{2(+t)}$

(c) $\frac{5}{2(-t)}$

(d) $\frac{5}{2(-t)}$

18.
$$\frac{\frac{x}{3} - y}{y - \frac{x}{3}}$$

- (a) $\left(\frac{x}{3} - y\right)^2$ (b) $\frac{x-y}{x+y}$ (c) -1 (d) $\frac{x-3y}{x+3y}$

For exercises 19-20, solve the equation.

19.
$$\frac{2}{x+2} - \frac{7}{x-3} = \frac{5}{x^2 - x - 6}$$

- (a) -5 (b) 5 (c) $\frac{3}{5}$ (d) $-\frac{3}{5}$

20. Solve the formula $H = \frac{b}{D+d}$ for D.

- (a) $D = \frac{b-d}{H}$ (b) $D = \frac{b}{H} - d$ (c) $D = b - Hd - H$ (d) $D = Hb - d$

For exercises 21-22, solve each problem.

21. Maria can paddle her canoe 2 miles upstream against the current in the same time it would take her to paddle 6 miles downstream. Maria can paddle 2 mph in still water. What is the speed of the current?

- (a) -1 mph (b) 1 mph (c) 3 mph (d) 4 mph

22. It takes Brad 2 hours to mow his lawn. It takes Kris 3 hours to mow the same lawn. At the same pace, how long would it take them to mow the lawn if they do the job together?

- (a) $2\frac{1}{2}$ hours (b) $1\frac{1}{5}$ hours (c) $1\frac{1}{6}$ hours (d) $\frac{5}{6}$ hours

Do your best! Rise to the challenge! Live and learn!