

**Part I: Multiple Choice. Write the correct answer in the space provided at the end of this section.**

1. What expression is equivalent to  $\frac{2x-1}{x+5}$ ,  $x \neq -5$ ?
  - (A)  $\frac{10x^2-5x}{x+15}$
  - (B)  $\frac{4x-2}{2x+10}$
  - (C)  $\frac{2x^2-x}{x^2+5x}$
  - (D)  $\frac{6x-3}{x+5}$
  
2. What are the non-permissible values that apply to the expression  $\frac{x^2-9}{x^2+4x+3}$ ?
  - (A)  $x \neq -3, x \neq -1$
  - (B)  $x \neq -1$
  - (C)  $x \neq 1$
  - (D)  $x \neq 1, x \neq 3$
  
3. Simplify  $\frac{4}{x} + \frac{x+1}{2x}$ .
  - (A)  $\frac{x+5}{3x}$
  - (B)  $\frac{5}{3x}$
  - (C)  $\frac{x+9}{2x}$
  - (D)  $\frac{x+5}{2x^2}$

4. What is the simplified form of the expression  $\frac{x^2+x-12}{x+2} \div \frac{x-3}{x+4}$ ?

(A)  $\frac{x-3}{x+2}$

(B)  $\frac{(x+3)(x-3)}{x+2}$

(C)  $\frac{x+4}{x+2}$

(D)  $\frac{(x+4)(x+4)}{x+2}$

5. What is the simplest form of the expression of  $\frac{2x^2+8x}{4x^3+16x^2}$ ?

(A)  $\frac{1}{2}$

(B)  $\frac{1}{2x}$

(C)  $\frac{2x}{4x^2}$

(D)  $\frac{x^2+4x}{x^3+4x^2}$

6. What is the lowest common denominator of the rational equation:

(A) 5  $\frac{3}{x-3} + \frac{x}{x^2-3x} = \frac{3x-1}{5}$

(B)  $x$

(C)  $x(x-3)$

(D)  $5x(x-3)$

7. What is the simplified form of  $\frac{x-3}{3-x}$ ?

- (A) 0
- (B) 1
- (C) -1
- (D)  $\frac{x-3}{3-x}$

8. Fred makes a mistake on his assignment. In which step does the mistake appear?

(A) Step 1  $\frac{c^2-36}{2c} \div \frac{c-6}{8c^2}$

(B) Step 2

(C) Step 3

(D) Step 4

Step 1

$$\frac{c^2-36}{2c} \times \frac{8c^2}{c-6}$$

Step 2

$$\frac{(c-6)(c-6)}{2c} \times \frac{(2c)(4c)}{c-6}$$

Step 3

$$\frac{(c-6)(\cancel{c-6})}{2\cancel{c}} \times \frac{(\cancel{2c})(4c)}{\cancel{c-6}}$$

Step 4

$$\frac{4c(c-6)}{1}$$

9. Simplify:  $\frac{2 + \frac{1}{x}}{4x - \frac{1}{x}}$

(A)  $\frac{-1}{2x}$

(B)  $\frac{-2x + 1}{2x}$

(C)  $\frac{1}{2x - 1}$

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

10. Bram can clean the shed in 5 hours, but it takes Sam 6 hours to do the same job. How long would it take them to clean the shed if they worked together? Which equation would you use to solve this problem?

(A)  $\frac{5}{x} + \frac{6}{x} = 1$

(B)  $\frac{x}{5} + \frac{x}{6} = \frac{x}{1}$

(C)  $\frac{1}{5+6} = \frac{1}{x}$

(D)  $\frac{1}{5} + \frac{1}{6} = \frac{1}{x}$

**Answers to multiple choice.**

1.\_\_\_\_ 2.\_\_\_\_ 3.\_\_\_\_ 4.\_\_\_\_ 5.\_\_\_\_

6.\_\_\_\_ 7.\_\_\_\_ 8.\_\_\_\_ 9.\_\_\_\_ 10.\_\_\_\_

**Part II: Constructed Response. Answer each question in the space provided. Show all workings.**

11. Simplify and state all non-permissible values:  $\frac{x^2-4}{2x^2+11x+5} \div \frac{x^2-x-6}{x^2+2x-15}$

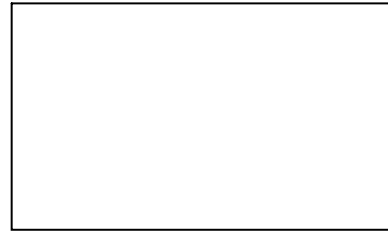
12. Simplify and state all non-permissible values:  $\frac{4x+9}{4x^2+13x+3} - \frac{3}{4x+1}$

13. Solve. Be sure to check for extraneous roots.

$$\frac{9}{y-3} - \frac{4}{y-6} = \frac{18}{y^2 - 9y + 18}$$

14. The rectangle has a perimeter of 4 units. What is the value of  $x$ ?

$$\frac{4}{x-2}$$



$$\frac{6}{x-2}$$

15. It takes Bill 8 hours longer to construct a patio than it takes Fred. If they work together, they can construct the patio in 20 hours. How long would it take Bill to construct the patio alone?