

NAME _____

DATE _____

Module Test A

Module 15

Fill in the blanks.

- In order to simplify a rational expression with more than one term in the numerator and/or denominator, the expression must first be factored.
- To add or subtract rational terms, a common denominator is needed.
- The domain of a rational term are all real numbers except the restricted values of the expression.
- A complex fraction is actually the division of two fractions.
- When fractions are divided, the operation is changed to multiplication with the reciprocal of the divisor.

Choose the correct response to each of the following:

- Simplify: $\frac{x+3}{3+x}$.
 a. $\frac{x+1}{1+x}$ **b.** 1 c. -1 d. $\frac{x+3}{3+x}$
- Simplify: $\frac{5-2q}{2q-5}$.
 a. $\frac{1-q}{q-1}$ b. 1 **c.** -1 d. $\frac{5-2q}{2q-5}$
- Find all restricted values for: $\frac{7y}{y^3-9y}$.
 a. 0 b. 3 c. -3 **d.** a, b, and c
- Find all restricted values for: $\frac{x^2-2x}{3}$.
 a. 0 b. 2 c. both a and b **d.** no restricted values
- Find the least common denominator for: $\frac{5}{6x}$ and $\frac{1}{4x^2}$.
a. $12x^2$ b. $6x$ c. $4x^2$ d. $2x$

11. Find the least common denominator for: $\frac{6+x}{x^2+5x+6}$ and $\frac{x}{x+3}$.

- a. $x^3 + 8x^2 + 21x + 18$ c. $x + 3$
 b. $x + 2$ d. $x^2 + 5x + 6$

12. Find the least common denominator for: $\frac{2}{x}$ and $\frac{4}{x+5}$.

- a. x b. $x + 5$ c. $x(x + 5)$ d. 4

Are the following statements true or false?

13. $\frac{x+3}{x+6}$ reduces to $\frac{x+1}{x+2}$.

False

14. $\frac{x-4}{x}$ has no restricted values.

False

15. $\frac{5}{3x+6}$ has the restricted value -2 .

True

16. $\frac{x+7}{3x}$ has the restricted value -3 .

False

17. $\frac{4(x-1)}{8(x-1)}$ reduces to $\frac{1}{2}$.

True

18. A least common denominator is needed to find the product of two fractions.

False

19. To subtract two fractions, the expression must be changed to addition with the reciprocal of the second fraction.

False

20. Simplify the rational expressions.

- a. $\frac{9x^3y^6z^2}{15x^7yz^2}$ $\frac{3y^5}{5x^4}$
 b. $\frac{6a+30}{8a+40}$ $\frac{3}{4}$
 c. $\frac{n^2-25}{n^2+3n-10}$ $\frac{n-5}{n-2}$
 d. $\frac{k^2+2k+1}{2k^2-k-3}$ $\frac{k+1}{2k-3}$

21. Multiply or divide the rational expressions. Simplify, if necessary.

- a. $\frac{10x^6}{2y^2} \cdot \frac{3y^2}{5x}$ $3x^5$
 b. $\frac{x^2+7x}{x^2-2x} \div \frac{x^2+9x+14}{x^2-4}$ 1
 c. $\frac{x+4}{5x^2+30x+45} \cdot \frac{5x^2+15x}{x^2+4x}$ $\frac{1}{x+3}$
 d. $\frac{\frac{6x^2}{x+2}}{4xy^3}$ $\frac{3x(x-3)}{2y^2(x+2)}$
 $xy-3y$

© 2003 BestQuest

22. Add or subtract the rational expressions. Simplify, if necessary.

- a. $\frac{5x+1}{2x+6} - \frac{x-11}{2x+6}$ $\frac{2}{5x-5}$ or $\frac{5x-5}{(x+5)(x-5)}$
- b. $\frac{3}{x+5} + \frac{2}{x-5}$ $\frac{6x+12}{(x+4)(x-3)}$ or $\frac{6x+12}{x^2+x-12}$
- c. $\frac{x-8}{x^2+x-12} + \frac{5}{x-3}$ $\frac{-x^2+x-18}{x(x-6)}$ or $\frac{-x^2+x-18}{x^2-6x}$
- d. $\frac{3}{x} - \frac{x+2}{x-6}$ $\frac{15-s}{6s^2}$
- e. $\frac{5}{2s^2} - \frac{1}{6s}$

Answer the questions with complete sentences.

23. List the steps taken when adding or subtracting rational terms with like denominators.

To add or subtract rational terms with like denominators, add or subtract the numerators, keep the common denominator, and simplify, if necessary.

24. Explain how to multiply rational expressions.

When rational expressions are multiplied, the numerators are multiplied together, and the denominators are multiplied together. The rational terms may be simplified before or after the product is found, provided a common factor is found in the numerator and the denominator may be divided out of the expression.

