

NAME _____

DATE _____

Module Test **B**

Module 15

Fill in the blanks.

- All real numbers except the restricted values of a rational term are the _____ of the function.
- A _____ is needed before rational terms can be added or subtracted.
- A rational expression with more than one term in the numerator and/or denominator must first be _____ in order to simplify.
- During the _____ of two fractions, the operation is changed to multiplication, and the reciprocal of the second fraction is used.
- A _____ is the division of two fractions, written in the form of a fraction.

Choose the correct response to each of the following:

- Simplify: $\frac{x-4}{4-x}$.
 a. 1 b. -1 c. $\frac{x-1}{1-x}$ d. $\frac{x-4}{4-x}$
- Simplify: $\frac{5+3r}{3r+5}$.
 a. 1 b. -1 c. $\frac{1+r}{r+1}$ d. $\frac{5+3r}{3r+5}$
- Find all restricted values for: $\frac{3x}{5}$.
 a. 0 b. 5 c. a and b d. no restricted values
- Find all restricted values for: $\frac{4}{x^2+7x-18}$.
 a. -9 b. 2 c. a and b d. no restricted values
- Find the least common denominator for: $\frac{2}{5x^3}$ and $\frac{1}{10x^2}$.
 a. 10 b. $2x^2$ c. $5x^3$ d. $10x^3$

11. Find the least common denominator for: $\frac{x}{x+4}$ and $\frac{1}{x+2}$.
- a. $x^2 + 6x + 8$ b. $x + 4$ c. $x + 2$ d. $x^2 + 8$
12. Find the least common denominator for: $\frac{5}{x-3}$ and $\frac{3x-1}{x^2-6x+9}$.
- a. $x - 3$ c. $x^2 - 6x + 9$
- b. $x - 6$ d. $x^3 - 9x^2 + 27x - 27$

Are the following statements true or false?

13. $\frac{x+5}{x+10}$ is in simplest form. _____
14. $\frac{4}{x+1}$ has no restricted values. _____
15. $\frac{x-3}{2x}$ has the restricted value 0. _____
16. $\frac{x-7}{2x+6}$ has the restricted value -6. _____
17. $\frac{3(q+5)}{6(q+5)}$ reduces to 2. _____
18. A least common denominator is needed to find the sum of two fractions. _____
19. To divide two fractions, the expression must be changed to multiplication with the reciprocal of the first fraction. _____

20. Simplify the rational expressions.

- a. $\frac{12x^5y^4z^3}{18xy^4z^2}$ _____
- b. $\frac{10b-20}{10b+20}$ _____
- c. $\frac{y^2+7y}{y^2-49}$ _____
- d. $\frac{3x^2+11x-4}{x^2+8x+16}$ _____

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

- a. $\frac{6yw}{3x^4w} \cdot \frac{2x^5yw^2}{4xy^2}$ _____
- b. $\frac{x^2+2x+1}{5x^2-5x} \div \frac{x^2-1}{5x}$ _____
- c. $\frac{n+4}{5n^2+30n+45} \cdot \frac{5n^2+15n}{n^2+4n}$ _____
- d. $\frac{\frac{x^2-9}{4x+2}}{\frac{x^2-3x}{2xy+y}}$ _____

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

- a. $\frac{3x}{x+5} + \frac{15}{x+5}$ _____
- b. $\frac{5x-3}{7x} - \frac{x-3}{7x}$ _____
- c. $\frac{q-4}{10q} + \frac{3}{2q}$ _____
- d. $\frac{5}{x+4} - \frac{2}{x+3}$ _____
- e. $\frac{5}{2y+3} - \frac{y-16}{6y^2+11y+3}$ _____

Answer the questions with complete sentences.

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

24. Explain how to divide rational expressions.



