

Worksheet 1.3.3: Multiplication and Division of Rational Algebraic Expressions

A. True or False

Write True if the statement is true or False if it is false. One point each.

1. The reciprocal of $\frac{x+y}{x^2+xy}$ is $\frac{x^2+xy}{x+y}$.
2. The reciprocal of $\frac{1}{3m^3}$ is $3m^3$.
3. The reciprocal of a^2-4 is $(a+2)(a-2)$.
4. The reciprocal of $3x-6$ is $3(x-2)$.
5. The reciprocal of $\frac{5m-2n}{2n-1}$ is $\frac{2n-1}{5m-2n}$.

B. Finding the Factored Form

Find the factored form of each polynomial. Choose the answer from the box. Write the letter only. One point each.

a. $(x+3)(x+2)$

b. $(x+4)(2x+3)$

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

d. $3x(x+1)$

e. $3(x+7)(x-1)$

f. $(x+6)(x-7)$

g. $2x(x+5)$

h. $5(4x-3)$

i. $7(x-2)$

j. $(x-3)^2$

6. $3x^2+18x-21$
7. $2x^2+11x+12$
8. $7x-14$
9. x^2-x-42
10. $2x^2+3x-20$
11. $20x-15$
12. $3x^2+3x$
13. x^2+5x+6
14. x^2-6x+9
15. $2x^2+10x$

C. Multiplying and Dividing Rational Expressions

Perform the indicated operation. Choose the answer from the box. Write the letter only. One point each.

a. $\frac{4(x-8)}{x+2}$

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

c. $\frac{3}{2x(x+4)}$

d. $\frac{7}{x-7}$

e. $\frac{5}{x+6}$

f. $\frac{x+3}{x-10}$

g. $2(x-1)$

h. $\frac{8x(x-2)}{x-9}$

i. $\frac{10x^2}{x+2}$

j. $\frac{x+10}{3}$

$$16. \frac{x^2 - 1}{x} \cdot \frac{2x}{x + 1}$$

$$17. \frac{1}{x + 5} \cdot \frac{7x + 35}{x - 7}$$

$$18. \frac{x^2 - 17x + 72}{x + 2} \cdot \frac{4x + 4}{x^2 - 8x - 9}$$

$$19. \frac{x - 4}{7x - 28} \cdot \frac{7x + 70}{3}$$

$$20. \frac{4x - 20}{x^2 - 10x + 25} \cdot \frac{x + 7}{6x^2 + 42x}$$

$$21. \frac{3}{2x} \div \frac{7x + 28}{7}$$

$$22. \frac{12x + 12}{x - 9} \div \frac{12x + 12}{8x^2 - 16x}$$

$$23. \frac{5}{7x^2} \div \frac{x^2 + 12x + 36}{7x^3 + 42x^2}$$

$$24. \frac{10x^3 + 100x^2}{6x^2 - 48x} \div \frac{x^2 + 12x + 20}{6x^2 - 48x}$$

$$25. \frac{x + 3}{x^2 - x - 90} \div \frac{x - 1}{x^2 + 8x - 9}$$