

5.1

Practice

Form G

Rational Expressions

Simplify each rational expression. State any restrictions on the variables.

1. $\frac{4x + 6}{2x + 3}$

2. $\frac{2y}{y^2 + 6y}$

3. $\frac{20 + 40x}{20x}$

4. $\frac{7x - 28}{x^2 - 16}$

5. $\frac{3y^2 - 3}{y^2 - 1}$

6. $\frac{3x^2 - 12}{x^2 - x - 6}$

7. $\frac{x^2 + 3x - 18}{x^2 - 36}$

8. $\frac{x^2 + 13x + 40}{x^2 - 2x - 35}$

Multiply. State any restrictions on the variables.

9. $\frac{5a}{5a + 5} \cdot \frac{10a + 10}{a}$

10. $\frac{2x + 4}{10x} \cdot \frac{15x^2}{x + 2}$

11. $\frac{x^2 - 5x}{x^2 + 3x} \cdot \frac{x + 3}{x - 5}$

12. $\frac{x^2 - 6x}{x^2 - 36} \cdot \frac{x + 6}{x^2}$

13. $\frac{5y - 20}{3y + 15} \cdot \frac{7y + 35}{10y + 40}$

14. $\frac{x - 2}{(x + 2)^2} \cdot \frac{x + 2}{2x - 4}$

15. $\frac{3x^3}{x^2 - 25} \cdot \frac{x^2 + 6x + 5}{x^2}$

16. $\frac{y^2 - 2y}{y^2 + 7y - 18} \cdot \frac{y^2 - 81}{y^2 - 11y + 18}$

Divide. State any restrictions on the variables.

17. $\frac{7x^4}{24y^5} \div \frac{21x}{12y^4}$

18. $\frac{6x + 6}{7} \div \frac{4x + 4}{x - 2}$

19. $\frac{5y}{2x^2} \div \frac{5y^2}{8x^2}$

20. $\frac{3y + 3}{6y + 12} \div \frac{18}{5y + 5}$

21. $\frac{y^2 - 49}{(y - 7)^2} \div \frac{5y + 35}{y^2 - 7y}$

22. $\frac{x^2 + 10x + 16}{x^2 - 6x - 16} \div \frac{x + 8}{x^2 - 64}$

23. $\frac{y^2 - 5y + 4}{y^2 - 1} \div \frac{y^2 - 9}{y^2 + 5y + 4}$

24. $\frac{x^2 - 4}{x^2 + 6x + 9} \div \frac{x^2 + 4x + 4}{x^2 - 9}$

5.1

Standardized Test Prep

Rational Expressions

Multiple Choice

For Exercises 1–4, choose the correct letter.

1. Which expression equals $\frac{x^2 - 4x - 5}{x^2 + 6x + 5}$?

(A) $x + 1$

(B) $-10x - 10$

(C) $\frac{x - 5}{x + 5}$

(D) $\frac{4x - 5}{6x + 5}$

2. Which expression equals $\frac{42a^2b^4}{12a^5b^{-2}}$?

(F) $\frac{7b^6}{2a^3}$

(G) $\frac{30a^7}{b^2}$

(H) $\frac{7ab^3}{2}$

(I) $\frac{30b^2}{a^3}$

3. Which expression equals $\frac{t^2 - 1}{t - 2} \cdot \frac{t^2 - 3t + 2}{t^2 + 4t + 3}$?

(A) $\frac{t^2 - 2t + 1}{t + 3}$

(B) $\frac{t^2 - 1}{t + 3}$

(C) $\frac{(t + 1)^2(t + 3)}{(t - 2)^2}$

(D) $\frac{2t^2 - 3t + 1}{t^2 + 5t + 1}$

4. What is the area of the triangle shown at the right?

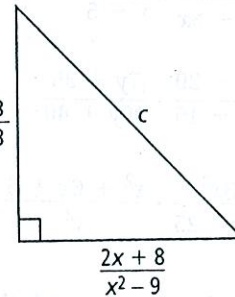
(F) $\frac{2x + 8}{x^2 - 6x + 9}$

(H) $\frac{x + 4}{x^2 - 6x + 9}$

(G) $\frac{x^2 + 6x + 9}{x + 4}$

(I) $\frac{2x^2 + 12x + 18}{x + 4}$

$\frac{x + 3}{x - 3}$



Short Response

5. What is the quotient $\frac{y + 2}{2y^2 - 3y - 2} \div \frac{y^2 - 4}{y^2 + y - 6}$ expressed in simplest form? State any restrictions on the variable. Show your work.