



5 Divide.

a. $\frac{3x^3}{2} \div (-15x^5)$

b. $\frac{y+3}{y+2} \div (y+2)$

c. $\frac{z^2+2z-15}{z^2+9z+20} \div (z-3)$

EXERCISES

For more exercises, see *Extra Skill and Word Problem Practice*.

Practice and Problem Solving

A Practice by Example

Example 1
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Multiply.

1. $\frac{7}{3} \cdot \frac{5x}{12}$

2. $\frac{3}{t} \cdot \frac{4}{t}$

3. $\frac{5}{3a^2} \cdot \frac{8}{a^3}$

4. $\frac{m-2}{m+2} \cdot \frac{m}{m-1}$

5. $\frac{2x}{x+1} \cdot \frac{x-1}{3}$

6. $\frac{6x^2}{5} \cdot \frac{2}{x+1}$

7. $\frac{4c}{2c+2} \cdot \frac{c+1}{c-1}$

8. $\frac{5x^3}{x^2} \cdot \frac{3x^4}{6x}$

9. $\frac{3t}{t-2} \cdot \frac{3t-6}{t^2}$

10. $\frac{m-2}{3m+9} \cdot \frac{2m+6}{2m-4}$

11. $\frac{x-5}{4x+6} \cdot \frac{6x+9}{3x-15}$

12. $\frac{4x+1}{5x+10} \cdot \frac{30x+60}{2x-2}$

13. $\frac{4t+4}{t-3} \cdot (t^2 - t - 6)$

14. $\frac{2m+1}{3m-6} \cdot (9m^2 - 36)$

15. $(x^2 - 1) \cdot \frac{x-2}{3x+3}$

Find the reciprocal of each expression.

16. $\frac{2}{x+1}$

17. $\frac{-6d^2}{2d-5}$

18. $c^2 - 1$

19. $s + 4$

Divide.

20. $\frac{x-1}{x+4} \div \frac{x+3}{x+4}$

21. $\frac{3t+12}{5t} \div \frac{t+4}{10t}$

22. $\frac{y-4}{10} \div \frac{4-y}{5}$

23. $\frac{x-3}{6} \div \frac{3-x}{2}$

24. $\frac{x^2+6x+8}{x^2+x-2} \div \frac{x+4}{2x+4}$

25. $\frac{2n^2-5n-3}{4n^2-12n-7} \div \frac{4n+5}{2n-7}$

26. $\frac{3x+9}{x} \div (x+3)$

27. $\frac{11k+121}{7k-15} \div (k+11)$

28. $\frac{x^2+10x-11}{x^2+12x+11} \div (x-1)$

B Apply Your Skills

Multiply or divide.

29. $\frac{t^2+5t+6}{t-3} \cdot \frac{t^2-2t-3}{t^2+3t+2}$

30. $\frac{c^2+3c+2}{c^2-4c+3} \div \frac{c+2}{c-3}$

31. $\frac{7t^2-28t}{2t^2-5t-12} \cdot \frac{6t^2-t-15}{49t^3}$

32. $\frac{5x^2+10x-15}{5-6x+x^2} \div \frac{2x^2+7x+3}{4x^2-8x-5}$

33. $\frac{x^2+x-6}{x^2-x-6} \div \frac{x^2+5x+6}{x^2+4x+4}$

34. $\left(\frac{x^2-25}{x^2-4x}\right)\left(\frac{x^2+x-20}{x^2+10x+25}\right)$

35. **Error Analysis** In the work shown at the right, what error did the student make in dividing the rational expressions?

$$\begin{aligned} \frac{3a}{a+2} \div \frac{(a+2)^2}{a-4} &= \frac{3a}{\cancel{a+2}} \div \frac{\cancel{(a+2)}^2}{a-4} \\ &= 3a \div \frac{a+2}{a-4} \\ &= 3a \cdot \frac{a-4}{a+2} \\ &= \frac{3a(a-4)}{a+2} \end{aligned}$$

36. **Open-Ended** Write two rational expressions. Find the product.37. **Critical Thinking** For what values of x is the expression

$$\frac{2x^2-5x-12}{6x} \div \frac{-3x-12}{x^2-16}$$

undefined?