

**11-5 Skills Practice****Dividing Polynomials**

Find each quotient.

1.  $(20x^2 + 12x) \div 4x$

2.  $(18n^2 + 6n) \div 3n$

3.  $(b^2 - 12b + 5) \div 2b$

4.  $(8r^2 + 5r - 20) \div 4r$

5.  $\frac{12p^3r^2 + 18p^2r - 6pr}{6p^2r}$

6.  $\frac{15k^2u - 10ku + 25u^2}{5ku}$

7.  $(x^2 - 5x - 6) \div (x - 6)$

8.  $(a^2 - 10a + 16) \div (a - 2)$

9.  $(n^2 - n - 20) \div (n + 4)$

10.  $(y^2 + 4y - 21) \div (y - 3)$

15.  $\frac{2c^2 - 5c - 3}{2c + 1}$

16.  $\frac{2r^2 + 6r - 20}{2r - 4}$

17.  $\frac{x^3 - 3x^2 - 6x - 20}{x - 5}$

18.  $\frac{p^3 - 4p^2 + p + 6}{p - 2}$

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**11.3 Skills Practice****Simplifying Rational Expressions**

State the excluded values for each rational expression.

- $\frac{2p}{p-7}$
- $\frac{4n+1}{n+4}$
- $\frac{k+2}{k^2-4}$
- $\frac{3x+15}{x^2-25}$
- $\frac{y^2-9}{y^2+3y-18}$
- $\frac{b^2-2b-8}{b^2+7b+10}$
- $\frac{21bc}{28bc^2}$
- $\frac{12m^2}{24m^3}$
- $\frac{16x^3y^2}{36x^2y^3}$
- $\frac{8a^2b^3}{40a^3b}$
- $\frac{n+6}{3n+18}$
- $\frac{4x-4}{4x+4}$
- $\frac{y^2-64}{y+8}$
- $\frac{y^2-7y-18}{y-9}$
- $\frac{z+1}{z^2-1}$
- $\frac{x+6}{x^2+2x-24}$

Simplify each expression. State the excluded values of the variables.

- $\frac{21bc}{28bc^2}$
- $\frac{12m^2}{24m^3}$
- $\frac{16x^3y^2}{36x^2y^3}$
- $\frac{8a^2b^3}{40a^3b}$
- $\frac{n+6}{3n+18}$
- $\frac{4x-4}{4x+4}$
- $\frac{y^2-64}{y+8}$
- $\frac{y^2-7y-18}{y-9}$
- $\frac{4x-4}{a(a+5)} \cdot \frac{a+5}{a+7}$
- $\frac{(a-7)(a+7)}{a(a+5)} \cdot \frac{a+5}{a+7}$
- $\frac{c^2}{d^3} \div \frac{d^3}{c^3}$
- $\frac{c^2}{d^3} \div \frac{2a^2}{12f^2}$
- $\frac{6a^3}{4f^2} \div \frac{2a^2}{12f^2}$
- $\frac{z^2}{y^2} \div \frac{x^2}{y}$
- $\frac{4m^3}{7p^2} \div \frac{2m}{7p}$
- $\frac{x-5}{x+3} \div (x-5)$
- $\frac{x^2-x-12}{6} \div \frac{x+3}{x-4}$
- $\frac{a^2-5a-6}{3} \div \frac{a-6}{a+1}$

**11.4 Skills Practice****Multiplying and Dividing Rational Expressions**

Find each product.

- $\frac{14}{c^2} \cdot \frac{c^5}{2c}$
- $\frac{3m^2}{2t} \cdot \frac{t^2}{12}$
- $\frac{2a^2b}{b^2c} \cdot \frac{b}{a}$
- $\frac{2x^2y}{3x^2y} \cdot \frac{3xy}{4y}$
- $\frac{3(4m-6)}{18r} \cdot \frac{9r^2}{2(4m-6)}$
- $\frac{4(n+2)}{n(n-2)} \cdot \frac{n-2}{n+2}$
- $\frac{(y-3)(y+3)}{4} \cdot \frac{8}{y+3}$
- $\frac{(x-2)(x+2)}{x(8x+3)} \cdot \frac{2(8x+3)}{x-2}$
- $\frac{3(4m-6)}{18r} \cdot \frac{9r^2}{2(4m-6)}$
- $\frac{4(b+4)}{(b-4)(b-3)} \cdot \frac{b-3}{b+4}$
- $\frac{c^2}{d^3} \div \frac{d^3}{c^3}$
- $\frac{6a^3}{4f^2} \div \frac{2a^2}{12f^2}$
- $\frac{4m^3}{7p^2} \div \frac{2m}{7p}$
- $\frac{x-5}{x+3} \div (x-5)$
- $\frac{x^2-x-12}{6} \div \frac{x+3}{x-4}$
- $\frac{a^2-5a-6}{3} \div \frac{a-6}{a+1}$

Find each quotient.

- $\frac{c^2}{d^3} \div \frac{d^3}{c^3}$
- $\frac{6a^3}{4f^2} \div \frac{2a^2}{12f^2}$
- $\frac{4m^3}{7p^2} \div \frac{2m}{7p}$
- $\frac{x-5}{x+3} \div (x-5)$
- $\frac{x^2-x-12}{6} \div \frac{x+3}{x-4}$
- $\frac{a^2-5a-6}{3} \div \frac{a-6}{a+1}$