12-3 Multiplying and Dividing Rational Expressions

1 EXAMPLE Multiplying Rational Expressions

Multiply.

a. $\dfrac{3}{x} \cdot \dfrac{4}{x^2}$

b. $\dfrac{x}{x+4} \cdot \dfrac{x-3}{x-2}$

Try:

1 Multiply.

a. $\dfrac{6}{a^2} \cdot \dfrac{-2}{a^3}$

b. $\dfrac{x-5}{x+3} \cdot \dfrac{x-7}{x}$

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2 EXAMPLE Using Factoring

Multiply $\dfrac{2x+1}{3}$ and $\dfrac{6x}{4x^2-1}$.

2 Multiply $\dfrac{x-2}{8x}$ and $\dfrac{-8x-16}{x^2-4}$.

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3 EXAMPLE Multiplying a Rational Expression by a Polynomial

Multiply $\dfrac{3s+2}{2s+4}$ and s^2+5s+6.

3 Multiply.

a. $\dfrac{3}{c} \cdot (c^3-c)$

b. $\dfrac{-2v}{v+3} \cdot (v^2-2v-15)$

c. $(m-1) \cdot \dfrac{4m+8}{m^2-1}$

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4 EXAMPLE Dividing Rational Expressions

Divide $\dfrac{a^2+7a+10}{a-6}$ by $\dfrac{a+5}{a^2-36}$.

4 Divide.

a. $\dfrac{a-2}{ab} \div \dfrac{a-2}{a}$

b. $\dfrac{5m+10}{2m-20} \div \dfrac{7m+14}{14m-20}$

c. $\dfrac{6n^2-5n-6}{2n^2-n-3} \div \dfrac{2n-3}{n+1}$

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5 EXAMPLE Dividing a Rational Expression by a Polynomial

Divide $\dfrac{x^2+3x+2}{4x}$ by $(5x^2+5x)$.

5 Divide.

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

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

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

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