

LESSON
10-4**Practice C****Multiplying and Dividing Rational Expressions****Multiply. Simplify your answer.**

1. $\frac{9rt^5}{5r^4} \cdot \frac{10r^2}{27t}$

2. $\frac{6a + 12}{3a + a^2} \cdot \frac{a + 3}{4a^2 + 8a}$

3. $\frac{2m}{5m + 20} \cdot (m^2 - 16)$

4. $\frac{p + 3}{p^2 - 25} \cdot \frac{3p - 15}{p^2 + p - 6}$

Divide. Simplify your answer.

5. $\frac{x^4y}{3z^5} \div \frac{x^2z^3}{9y^2z}$

6. $\frac{8n^2 - 8}{10n + 10n^2} \div (2n^3 + 6n^2 - 8n)$

7. At the town fair, Jillian is in charge of pulling two winning tickets out of a box containing tickets for a prize drawing. There are 12 more tickets from female entrants than from male entrants.

a. If the same person cannot win twice, write and simplify an expression that represents the probability of Jillian picking a female winner, then a male winner.

b. If the same person can win twice, write and simplify an expression that represents the probability of Jillian picking a female winner, then a female winner.

c. What is the probability that Jillian pulls two female winning tickets if the same person can win twice, and if there are 25 tickets from female entrants before her first pick? Round to the nearest hundredth.

LESSON **Practice A**
10-4 **Multiplying and Dividing Rational Expressions**

Multiply. Simplify your answer.

1. $\frac{3x^2}{2y^4} \cdot \frac{4xy^4}{x^6}$

2. $\frac{2q-8}{6q^2} \cdot \frac{q^5}{pq-4p}$

$\frac{6}{x^3}$

$\frac{q^3}{3p}$

3. $\frac{ab}{5ab-5b} \cdot (a^2+3a-4)$

4. $\frac{2}{4m^2+8m} \cdot \frac{m^2+8m+12}{6+m}$

$\frac{a^2+4a}{5}$

$\frac{1}{2m}$

Divide by multiplying the reciprocal. Simplify your answer.

5. $\frac{c^4d}{9c} \div \frac{2cd^8}{3c^4d^2}$

6. $\frac{k^2-6k+9}{k+1} \div \frac{8k^2-24k}{2k^2}$

$\frac{c^6}{6d^5}$

$\frac{k^2-3k}{4k+4}$

7. For a game at school, Alma is asked to pull the names of two students out of a bag without looking, and without replacing the first name. There are 3 more boys than girls in the class.

a. Let x represent the number of girls in the class. Write an expression to represent the number of boys.

$x+3$

b. Write a simplified expression to represent the total number of students (girls + boys) in the class.

$2x+3$

c. Write and simplify an expression that represents the probability of Alma picking a girl, then a boy.
 Hint: Use $P(A \text{ and } B) = P(A) \cdot P(B \text{ after } A)$.

$\frac{x(x+3)}{(2x+3)(2x+2)}$

d. Substitute 10 for x in your expression from part c to find the probability that Alma picks a girl then a boy when there are 10 girls in the class. Round to the nearest whole percent.

$\approx 26\%$

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LESSON **Practice B**
10-4 **Multiplying and Dividing Rational Expressions**

Multiply. Simplify your answer.

1. $\frac{8a^2b^5}{a^3} \cdot \frac{3a^2}{4b^8}$

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

$\frac{6a}{b^4}$

$8x$

3. $\frac{7}{2t-6} \cdot (t^2+t-12)$

4. $\frac{3x^2+xy^3}{y^3} \cdot \frac{2xy+8y}{4x+x^2}$

$\frac{7t+28}{2}$

$\frac{6x+2y^3}{y^2}$

Divide. Simplify your answer.

5. $\frac{5j^2k^2}{3jk^5} \div \frac{10j^2k}{9j^3}$

6. $\frac{3c^2+24c}{c^2-2c+1} \div \frac{c^2+9c+8}{9c-9}$

$\frac{3j^2}{2k^4}$

$\frac{27c}{c^2-1}$

7. Ramon is playing a game in which he must pull two blocks out of a bag containing red and yellow blocks. He cannot look, and he cannot replace the block. The bag has 4 more red blocks than yellow blocks.

a. Write and simplify an expression that represents Ramon's probability of picking a red block, then a yellow block.

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

b. What is the probability that Ramon pulls a red block then a yellow block if there are 6 yellow blocks in the bag before his first pick?

25%

c. What is the probability that Ramon pulls two yellow blocks if there are 6 yellow blocks in the bag before his first pick?

12.5%

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LESSON **Practice C**
10-4 **Multiplying and Dividing Rational Expressions**

Multiply. Simplify your answer.

1. $\frac{9r^6}{5r^4} \cdot \frac{10r^2}{27t}$

2. $\frac{6a+12}{3a+a^2} \cdot \frac{a+3}{4a^2+8a}$

$\frac{2r^4}{3r}$

$\frac{3}{2a^2}$

3. $\frac{2m}{5m+20} \cdot (m^2-16)$

4. $\frac{p+3}{p^2-25} \cdot \frac{3p-15}{p^2+p-6}$

$\frac{2m^2-8m}{5}$

$\frac{3}{p^2+3p-10}$

Divide. Simplify your answer.

5. $\frac{x^4y}{3z^3} \div \frac{x^2z^3}{9y^2z}$

6. $\frac{8n^2-8}{10n+10n^2} \div (2n^3+6n^2-8n)$

$\frac{3x^2y^3}{z^7}$

$\frac{2}{5n^3+20n^2}$

7. At the town fair, Jillian is in charge of pulling two winning tickets out of a box containing tickets for a prize drawing. There are 12 more tickets from female entrants than from male entrants.

a. If the same person cannot win twice, write and simplify an expression that represents the probability of Jillian picking a female winner, then a male winner.

$\frac{x(x+12)}{2(x+6)(2x+11)}$

b. If the same person can win twice, write and simplify an expression that represents the probability of Jillian picking a female winner, then a female winner.

$\frac{(x+12)^2}{4(x+6)^2}$

c. What is the probability that Jillian pulls two female winning tickets if the same person can win twice, and if there are 25 tickets from female entrants before her first pick? Round to the nearest hundredth.

43.28%

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LESSON **Review for Mastery**
10-4 **Multiplying and Dividing Rational Expressions**

If a , b , c , and d are nonzero polynomials, then $\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$. You can make any expression rational by writing it with a denominator of 1.

Multiply $\frac{x+1}{7} \cdot \frac{5}{6x+6}$. Simplify your answer.

$\frac{x+1}{7} \cdot \frac{5}{6x+6}$

Multiply the numerators and the denominators.

$\frac{5(x+1)}{7(6x+6)}$

Factor.

$\frac{5(x+1)}{7 \cdot 6(x+1)}$

Simplify.

$\frac{5(\cancel{x+1})^1}{7 \cdot 6(\cancel{x+1})^1}$

$\frac{5}{42}$

Multiply $(3x+12) \cdot \frac{2}{x^2-x-20}$. Simplify your answer.

$(3x+12) \cdot \frac{2}{x^2-x-20}$

Write as a rational expression.

$\frac{3x+12}{1} \cdot \frac{2}{x^2-x-20}$

Factor.

$\frac{3(x+4)}{1} \cdot \frac{2}{(x+4)(x-5)}$

Simplify.

$\frac{3(\cancel{x+4})^1}{1} \cdot \frac{2}{(\cancel{x+4})^1(x-5)}$

$\frac{6}{x-5}$

Multiply. Simplify your answer.

1. $\frac{x+3}{5x} \cdot \frac{2}{4x+12}$

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

3. $\frac{4x-12}{6x} \cdot \frac{x+3}{x^2-9}$

$\frac{(x+3)}{(5x)} \cdot \frac{(2)}{(4)(x+3)}$

$\frac{1}{10x}$

$3x+6$

$\frac{2}{3x}$

4. $(4x+24) \cdot \frac{5}{x^2-36}$

5. $(x+7) \cdot \frac{3x}{x^2+13x+42}$

6. $(x^2-16) \cdot \frac{6}{x^2-x-12}$

$\frac{20}{x-6}$

$\frac{3x}{x+6}$

$\frac{6x+24}{x+3}$