Name: _____ Period: _____ Date: _____

# Multiplying and Dividing Rational Expressions Bell Work

**Multiply the following rational expressions.**

1. $\frac{3x}{y} \times \frac{5}{x}$

2. $\frac{x-4}{y} \times \frac{y}{x^2-16}$

3. $3c-12 \times \frac{6c}{c^2-16}$

4. $\frac{x^2-x-6}{x^2+2x-15} \times \frac{x^2-25}{x^2-4x-5}$

**Divide the following rational expressions:**

5. $\frac{10m^6}{3m^2} \div \frac{27m^3}{81m}$

6. $\frac{10x^2y}{m+3} \div \frac{15xy^2}{3+m}$

7. $\frac{4c+4}{c^2-25} \div \frac{20}{c^2-5c}$

8. $\frac{y^2-y-20}{y^2+7y+12} \div \frac{y^2-7y+10}{y^2+9y+18}$

**Perform the indicated operation on the rational expressions.**

9. $\frac{24x^2y^3}{39z^2} \times \frac{25x^3z^3}{18y^4} \div \frac{15x^4}{26x^2y^2}$

10. $\frac{x^2y-xy}{y^2-1} \times \frac{y^3+y^2}{x^3-x^2} \div \frac{y^2}{y-1}$

Name: _____ Period: _____ Date: _____

# Multiplying and Dividing Rational Expressions Bell Work

**Answer:**

**Multiply the following rational expressions.**

1. $\frac{3x}{y} \times \frac{5}{x}$

**Solution:**

$\frac{3\cancel{x}}{y} \times \frac{5}{\cancel{x}} = \frac{15}{y}$

2. $\frac{x-4}{y} \times \frac{y}{x^2-16}$

**Solution:**

$\frac{x-4}{y} \times \frac{y}{x^2-16} = \frac{\cancel{x-4}}{\cancel{y}} \times \frac{\cancel{y}}{(x+4)\cancel{(x-4)}}$

$= \frac{1}{x+4}$

3. $3c-12 \times \frac{6c}{c^2-16}$

**Solution:**

$3c-12 \times \frac{6c}{c^2-16} = 3\cancel{(c-4)} \frac{6c}{\cancel{(c-4)}(c+4)}$

$= \frac{24c}{c+4}$

4. $\frac{x^2-x-6}{x^2+2x-15} \times \frac{x^2-25}{x^2-4x-5}$

**Solution:**

$\frac{x^2-x-6}{x^2+2x-15} \times \frac{x^2-25}{x^2-4x-5}$

$= \frac{(x+2)\cancel{(x-3)}}{\cancel{(x+5)(x-3)}} \times \frac{\cancel{(x+5)(x-5)}}{\cancel{(x-5)}(x+1)}$

$= \frac{x+2}{x+1}$

**Divide the following rational expressions:**

5. $\frac{10m^6}{3m^2} \div \frac{27m^3}{81m}$

**Solution:**

$\frac{10m^6}{3m^2} \div \frac{27m^3}{81m} = \frac{10m^6}{\cancel{3m^2}} \times \frac{\cancel{3}(27)m}{\cancel{27m^3}} = 10m^2$

6. $\frac{10x^2y}{m+3} \div \frac{15xy^2}{3+m}$

**Solution:**

$\frac{10x^2y}{m+3} \div \frac{15xy^2}{3+m} = \frac{10x^2y}{m+3} \times \frac{3+m}{15xy^2}$

$= \frac{\cancel{5}(2)x^2\cancel{y}}{\cancel{m+3}} \times \frac{\cancel{3+m}}{\cancel{5}(3)\cancel{x}y^{\cancel{2}}} = \frac{2x}{3y}$

7. $\frac{4c+4}{c^2-25} \div \frac{20}{c^2-5c}$

**Solution:**

$\frac{4c+4}{c^2-25} \div \frac{20}{c^2-5c} = \frac{4c+4}{c^2-25} \times \frac{c^2-5c}{20}$

$= \frac{\cancel{4}(c+1)}{(c+5)\cancel{(c-5)}} \times \frac{c\cancel{(c-5)}}{5\cancel{(4)}} = \frac{4(c+1)}{5(c+5)}$

8. $\frac{y^2-y-20}{y^2+7y+12} \div \frac{y^2-7y+10}{y^2+9y+18}$

**Solution:**

$\frac{y^2-y-20}{y^2+7y+12} \div \frac{y^2-7y+10}{y^2+9y+18}$

$= \frac{y^2-y-20}{y^2+7y+12} \times \frac{y^2+9y+18}{y^2-7y+10}$

$= \frac{\cancel{(y-5)(y+4)}}{\cancel{(y+3)(y+4)}} \times \frac{\cancel{(y+3)}(y+6)}{(y-2)\cancel{(y-5)}} = \frac{y+6}{y-2}$

Name: _____ Period: _____ Date: _____

# Multiplying and Dividing Rational Expressions Bell Work

**Perform the indicated operation on the rational expressions.**

**9.** $\frac{24x^2y^3}{39z^2} \times \frac{25x^3z^3}{18y^4} \div \frac{15x^4}{26x^2y^2}$

**Solution:**

$\frac{24x^2y^3}{39z^2} \times \frac{25x^3z^3}{18y^4} \div \frac{15x^4}{26x^2y^2}$

$= \frac{4\cancel{(6)}\cancel{x^2}y^3}{3\cancel{(13)}\cancel{z^2}} \times \frac{5\cancel{(5)}x^3z^3}{3\cancel{(6)}\cancel{y^4}} \times \frac{2\cancel{(13)}\cancel{x^2}\cancel{y^2}}{3\cancel{(5)}\cancel{x^4}} = \frac{40x^3yz}{27}$

**10.** $\frac{x^2y - xy}{y^2 - 1} \times \frac{y^3 + y^2}{x^3 - x^2} \div \frac{y^2}{y - 1}$

**Solution:**

$\frac{x^2y - xy}{y^2 - 1} \times \frac{y^3 + y^2}{x^3 - x^2} \div \frac{y^2}{y - 1}$

$= \frac{x^2y - xy}{y^2 - 1} \times \frac{y^3 + y^2}{x^3 - x^2} \times \frac{y - 1}{y^2}$

$= \frac{\cancel{xy(x - 1)}}{\cancel{(y + 1)(y - 1)}} \times \frac{\cancel{y^2}(y + 1)}{x^2\cancel{(x - 1)}} \times \frac{\cancel{y - 1}}{\cancel{y^2}} = \frac{y}{x}$