Multiplying and Dividing Rational Expressions

Multiplying

Step 1: Factor all numerators and denominators completely.
Step 2: Cancel common factors vertically and diagonally.
Step 3: Multiply across.

Dividing

Step 1: Change the division symbol to multiplication and then flip the fraction that follows.
Step 2: Factor all numerators and denominators completely.
Step 3: Cancel common factors vertically and diagonally.
Step 4: Multiply across.

Directions: Multiply or divide and express your answer in simplest form.

1. $\frac{5x^2y}{2xy^3} \cdot \frac{6x^3y^2}{10y}$

2. $\frac{(2x)^2}{(3y)^3} \div \frac{2x^2}{3y^3}$

3. $\frac{xy+3y}{6x} \cdot \frac{2x^2-6x}{x^2-9}$

4. $\frac{4x^2-4x}{2xy^3} \div \frac{6x^3y^2}{10y}$

5. $\dfrac{(x+1)^2}{x^3-x} \bullet \dfrac{(x-1)^2}{x}$

6. $\dfrac{x^2-6x+5}{1-x^2} \div \dfrac{x^2-25}{x^3+1}$

7. $(2x+3) \div \dfrac{x^3+10x^2}{6x^3-9x^2} \bullet \dfrac{x^2+12x+20}{4x^2-9}$