

Warm-Up Notes

MAT 100: ELEMENTARY ALGEBRA

Fall 2026

SECTION 6.6 DIVIDE POLYNOMIALS

Install — 10 minute lesson

Objectives of this Section

- Divide a polynomial by a monomial
- Divide a polynomial by a binomial

Skills

Introduced in this section:

- **POL.DP** — Dividing Polynomials

Also practiced: WRD.NM (Naming the model).

Lesson

Dividing a polynomial works the same way dividing a whole number does: you're breaking a bigger expression into pieces you can actually handle. If you're dividing by a single term, you can split the fraction apart and divide piece by piece. If you're dividing by a two-term expression, splitting doesn't work anymore, and instead you'll use a process that looks exactly like the long division you've done with numbers since elementary school.

I do

Watch. Let $AC(x) = \frac{7x + 500}{x}$ denote the average cost (in dollars) to produce x albums. What is the average cost when $x = 20$?

We do

Together. Compute the quotient and remainder when dividing the polynomial by the binomial. $(t^2 - 12t + 36) \div (t - 6)$.

You do

Your turn. Compute the quotient and remainder when dividing the polynomial by the binomial. $(4x^2 - 17x - 15) \div (x - 5)$.

Your turn. Identify the error in the following algebraic step and state the correct evaluation: $\frac{48y + 6}{6}$ is simplified as $\frac{48y + 6}{6} = 48y$.

Practice

1. Compute the quotient and remainder when dividing the polynomial by the binomial. $(a^2 - 2a - 35) \div (a + 5)$.

2. Compute the quotient and remainder when dividing the polynomial by the binomial. $(3b^3 + b^2 + 2) \div (b + 1)$.

3. Compute the quotient and remainder when dividing the polynomial by the binomial. $(y^2 - 3y - 15) \div (y - 8)$.

4. Let $AC(x) = (7x + 500)/x$ denote the average cost (in dollars) to produce x albums. What is the average cost when $x = 20$?