

Dividing Polynomials; Remainder
and Factor Theorem

1. Divide using long division

$$(x^2 + 2x - 24) \div (x - 4)$$

2. Divide using long division

$$(2x^3 + 10x^2 - 3x + 1) \div (x - 2)$$

3. Divide using long division

$$\frac{x^5 - 3x^4 + 5x^3 + x^2}{x^3 - 2}$$

4. Divide using synthetic division

$$(x^2 + 3x - 7) \div (x - 2)$$

5. Divide using synthetic division

$$(9x^2 - 4x - 3) \div (x - 2)$$

6. Divide using synthetic division

$$(x^5 + 3x^4 - 4x^2 + x + 2) \div (x - 2)$$

7. Divide using synthetic division

$$(x^2 - 5x - 2x^3 + x^4) \div (3 + x)$$

8. Divide using synthetic division

$$\frac{x^5 - 32}{x - 2}$$

9. Use synthetic division and the Remainder Theorem to find the indicated function value

$$f(x) = x^3 - 2x^2 + 3x - 1; \quad f(2)$$

10. Use synthetic division to divide

$$f(x) = x^3 - 3x^2 - 10x + 24 \text{ by } x - 2$$

Use the result to find all zeros of f.

11. Solve the equation:

$$x^3 - 3x^2 - 13x + 15 = 0$$

given that -3 is a zero.