

Synthetic Division

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Exercises

1. For which of the following can synthetic division be used?

(a) $(2x^3 - 3x_2 + 4x + 5) \div (x + 2)$

(b)

$$\frac{2x^4 + 4x^2 - 1}{x - 1}$$

(c)

$$\frac{4x^3 - 2x^2 - 3}{2x^2 - 1}$$

(d)

$$\frac{12x^3 - 11x^2 + 9x + 18}{4x + 3}$$

(e) $(-9x^4 + 10x^3 + 7x^2 - 6) \div (x - 1)$

(f)

$$\frac{2x^3 - 4x + 7x^2 + 3}{x^2 + 2x - 1}$$

2. Use synthetic division to find the root of the polynomial $p(x)$ given the linear factors below,

$$x - 1, \quad x - 5, \quad x + 5$$

(a) $p(x) = 2x^3 - 13x^2 + 17x - 10$

(b) $p(x) = 3x^3 + 17x^2 + 6x - 20$

3. Use synthetic division or long division to find the oblique asymptote, if any, for the following rational functions,

(a)

$$\frac{x^2 - 6x - 1}{x + 3}$$

(b)

$$\frac{x^3 - 5x}{x^2 + 1}$$

(c)

$$\frac{3x^3}{4x^2 - 8x}$$

(d)

$$\frac{x^2 + 2x - 12}{x - 5}$$

(e)

$$\frac{x^2 + 6x - 4}{3x - 6}$$