

Week 12 Exercises

1. Use the graphical method (like pages 128–130) to find the quotient of the following divisions.

$$(a) f(x) = \frac{x^3 + 6x^2 + 16x + 14}{x^2 + 3x + 5}$$

$$(b) f(x) = \frac{2x^3 - 5x^2 - 13x + 20}{x^2 + x - 3}$$

$$(c) f(x) = \frac{x^5 - 2x^2 + x^4 - 10x + 9}{x^3 + 2 * x - 5}$$

2. Use long division to find the quotient of the following divisions. Compare your answers here with the previous exercise.

$$(a) f(x) = \frac{x^3 + 6x^2 + 16x + 14}{x^2 + 3x + 5}$$

$$(b) f(x) = \frac{2x^3 - 5x^2 - 13x + 20}{x^2 + x - 3}$$

$$(c) f(x) = \frac{x^5 - 2x^2 + x^4 - 10x + 9}{x^3 + 2 * x - 5}$$

3. Do Exercise 2.3.4 from the text (page 122).
4. Do Exercise 2.3.5 from the text (page 122).
5. Do Exercise 2.3.6 from the text (page 122).
6. Write an algebraic expression for the a rational function that has vertical asymptotes at $x = -2$ and $x = 3$.
7. Write an algebraic expression for the a rational function that has vertical asymptotes at $x = 5$ and $x = -3$, and a horizontal asymptote at $y = 2$.
8. Write an algebraic expression for the a rational function that has vertical asymptotes at $x = 2$ and $x = -3$, and a hole (but no asymptote) at $x = 3$.
9. Write an algebraic expression for the a rational function that has vertical asymptotes at $x = -1$, $x = 7$ and $x = 3$, a hole at $x = 2$ and $x = -5$, and a horizontal asymptote at $y = -1$.
10. Write an algebraic expression for the a rational function that has vertical asymptotes at $x = -1$, $x = 7$ and $x = 3$, a hole at $x = 2$ and $x = -5$, a horizontal asymptote at $y = -1$, and roots (or zeros) at $x = 0$, $x = 1$ and $x = -2$.