

Ch. 3 Test Review

Use synthetic division to divide the polynomial.

1.
$$\frac{4x^3 - 11x^2 + 5x - 2}{x - 3}$$

2.
$$\frac{x^4 + 9x^3 + 6x^2 - 65x - 63}{x + 7}$$

Use long division to divide the polynomial.

3.
$$\frac{-2x^5 + 3x^3 - x^2 - 5x + 11}{x - 5}$$

4.
$$\frac{3x^4 - 2x^3 - x^2 + 15x - 2}{x + 3}$$

Use synthetic division to determine whether the binomial is a factor of $P(x)$.

5. $P(x) = x^3 - 11x^2 + 39x - 45$; $x - 5$

6. $P(x) = 2x^4 - 11x^3 + 11x^2 - 33x + 15$; $x + 2$

Determine the far-left and the far-right behavior of the graph of the function.

7. $P(x) = -2x^3 - 5x^2 + 6x - 3$

8. $P(x) = -x^4 + 3x^3 - 2x^2 + x - 5$

Find all relative and absolute extreme values. Round the nearest hundredth.

9. $P(x) = 2x^3 - x^2 - 3x + 1$

10. $P(x) = x^4 - 2x^2 + x + 1$

Use the Rational Zero Theorem to list possible rational zeros for each polynomial function.

11. $P(x) = x^3 - 7x - 6$

12. $P(x) = 2x^3 + 3x^2 - 29x - 30$

Use Descartes' Rule of Signs to state the number of possible positive and negative real zeros of each polynomial function.

13. $P(x) = -2x^5 + 4x^3 + 5x^2 - 2x - 6$

14. $P(x) = 7x^3 + x^4 + 3x^2 - 8x + 15$

Find the zeros of the polynomial function.

15. $P(x) = 2x^4 - 5x^3 - 15x^2 + 40x - 42$

16. $P(x) = 6x^4 + 35x^3 + 72x^2 + 60x + 16$

Find the zeros of the polynomial function and write as a product of its leading coefficient and its linear factors.

17. $P(x) = 2x^4 - 9x^3 + 22x^2 - 29x + 10$

18. $P(x) = x^4 - 6x^3 + 21x^2 - 46x + 30$

Use the given zero to find the remaining zeros of each polynomial function.

19. $P(x) = x^4 - 4x^3 + 6x^2 - 4x - 15$; $1 - 2i$

20. $P(x) = x^4 - x^3 - 17x^2 + 55x - 50$; $2 + i$

Determine the vertical and horizontal asymptotes of each rational function.

21. $f(x) = \frac{2x^2 + 3x - 5}{6x^2 - x - 35}$

22. $h(x) = \frac{3x - 17}{x^3 - 16x}$

23. $f(x) = \frac{5x^2 - 2x + 3}{\frac{1}{3}x^2 + x + 4}$

Find the slant asymptote of each rational function.

24. $f(x) = \frac{x^3 - 5x^2 + x + 12}{x^2 - 2x - 5}$

25. $g(x) = \frac{-2x^4 - 3x^3 - 2x^2 + 5x + 3}{x^3 - 2x^2 - 5}$