21. ★ MULTIPLE CHOICE Which point is a local maximum of the function $f(x) = 0.25(x + 2)(x − 1)^2$?

   Ⓐ (−2, 0)   Ⓑ (−1, 1)   Ⓒ (1, 0)   Ⓓ (2, 1)

GRAPHING CALCULATOR **Use a graphing calculator to graph the polynomial function. Identify the *x*-intercepts and the points where the local maximums and local minimums occur.**

22. $f(x) = 2x^3 + 8x^2 − 3$

23. $g(x) = 0.5x^3 − 2x + 2.5$

24. $h(x) = −x^4 + 3x$

25. $f(x) = x^5 − 4x^3 + x^2 + 2$

26. $g(x) = x^4 − 3x^2 + x$

27. $h(x) = x^4 − 5x^3 + 2x^2 + x − 3$

28. $h(x) = x^5 + 2x^2 − 17x − 4$

29. $g(x) = 0.7x^4 − 8x^3 + 5x$

30. ★ MULTIPLE CHOICE What is a turning point of the graph of the function $g(x) = x^4 − 9x^2 + 4x + 12$?

   Ⓐ (−3, 0)   Ⓑ (−1, 0)   Ⓒ (0, 12)   Ⓓ (2, 0)

31. **REASONING** Why is the adjective *local* used to describe the maximums and minimums of cubic functions but not quadratic functions?

32. ★ SHORT RESPONSE Does a cubic function *always*, *sometimes*, or *never* have a turning point? *Justify* your answer.

33. ★ OPEN-ENDED MATH Write a cubic function, a quartic function, and a fifth-degree function whose graphs have *x*-intercepts only at $x = −2$, 0, and 4.

DOMAIN AND RANGE **Graph the function. Then identify its domain and range.**

34. $f(x) = x(x − 3)^2$

35. $f(x) = x^2(x − 2)(x − 4)(x − 5)$

36. $f(x) = (x + 1)^3(x − 1)$

37. $f(x) = (x + 2)(x + 1)(x − 1)^2(x − 2)^2$

38. **CHALLENGE** In general, what can you say about the domain and range of odd-degree polynomial functions? What can you say about the domain and range of even-degree polynomial functions?

PROBLEM SOLVING

In Exercises 39 and 40, assume that the box is constructed using the method illustrated in Example 3 on page 389.

39. **POSTCARDS** Marcie wants to make a box to hold her postcard collection from a piece of cardboard that is 10 inches by 18 inches. What are the dimensions of the box with the maximum volume? What is the maximum volume of the box?

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40. **COIN COLLECTION** Jorge is making a box for his coin collection from a piece of cardboard that is 30 centimeters by 40 centimeters. What are the dimensions of the box with the maximum volume? What is the maximum volume of the box?

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