23. **MULTIPLE CHOICE** According to the rational zero theorem, which is *not* a possible zero of the function $f(x) = 2x^4 - 5x^3 + 10x^2 - 9$?

(A) -9 (B) $-\frac{1}{2}$ (C) $\frac{5}{2}$ (D) 3

FINDING REAL ZEROS **Find all real zeros of the function.**

24. $f(x) = 2x^3 + 2x^2 - 8x - 8$
25. $g(x) = 2x^3 - 7x^2 + 9$
26. $h(x) = 2x^3 - 3x^2 - 14x + 15$
27. $f(x) = 3x^3 + 4x^2 - 35x - 12$
28. $f(x) = 3x^3 + 19x^2 + 4x - 12$
29. $g(x) = 2x^3 + 5x^2 - 11x - 14$
30. $g(x) = 2x^4 + 9x^3 + 5x^2 + 3x - 4$
31. $h(x) = 2x^4 - x^3 - 7x^2 + 4x - 4$
32. $h(x) = 3x^4 - 6x^3 - 32x^2 + 35x - 12$
33. $f(x) = 2x^4 - 9x^3 + 37x - 30$
34. $f(x) = x^5 - 3x^4 - 5x^3 + 15x^2 + 4x - 12$
35. $h(x) = 2x^5 + 5x^4 - 3x^3 - 2x^2 - 5x + 3$

ERROR ANALYSIS ***Describe*** **and correct the error in listing the possible rational zeros of the function.**

36.

$f(x) = x^3 + 7x^2 + 2x + 14$

Possible zeros:

1, 2, 7, 14

37.

$f(x) = 6x^3 - 3x^2 + 12x + 5$

Possible zeros:

$\pm 1, \pm 2, \pm 3, \pm 6, \pm \frac{1}{5}, \pm \frac{2}{5}, \pm \frac{3}{5}, \pm \frac{6}{5}$

38. **OPEN-ENDED MATH** Write a polynomial function f that has a leading coefficient of 4 and has 12 possible rational zeros according to the rational zero theorem.

39. **MULTIPLE CHOICE** Which of the following is *not* a zero of the function $f(x) = 40x^5 - 42x^4 - 107x^3 + 107x^2 + 33x - 36$?

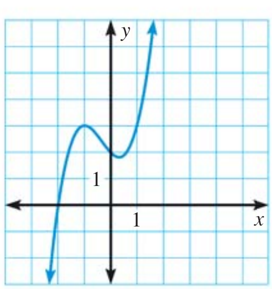
(A) $-\frac{3}{2}$ (B) $-\frac{3}{8}$ (C) $\frac{3}{4}$ (D) $\frac{4}{5}$

40. **SHORT RESPONSE** Let a_n be the leading coefficient of a polynomial function f and a_0 be the constant term. If a_n has r factors and a_0 has s factors, what is the largest number of possible rational zeros of f that can be generated by the rational zero theorem? *Explain* your reasoning.

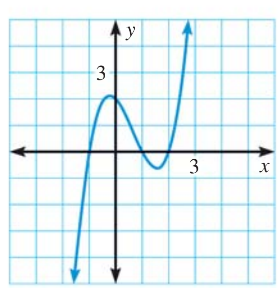
MATCHING **Find all real zeros of the function. Then match each function with its graph.**

41. $f(x) = x^3 - 2x^2 - x + 2$
42. $g(x) = x^3 - 3x^2 + 2$
43. $h(x) = x^3 + x^2 - x + 2$

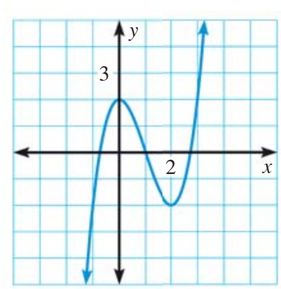
A.



B.



C.



44. **CHALLENGE** Is it possible for a cubic function to have more than three real zeros? Is it possible for a cubic function to have no real zeros? *Explain.*