

**EXERCISE A**

Use synthetic substitution to find  $g(3)$  and  $g(-4)$  for each function.

1)  $g(x) = x^2 - 8x + 6$                       2)  $g(x) = x^3 + 2x^2 - 3x + 1$                       3)  $g(x) = x^3 - 5x + 2$

4)  $g(x) = 3x^4 + x^3 - 2x^2 + x + 12$                       5)  $g(x) = x^6 - 4x^4 + 3x^2 - 10$

Determine if the binomial given is a factor of the polynomial given (answer yes or no, but show proof).

6)  $x^4 + x^3 - 17x^2 - 20x + 32; x - 4$                       7)  $2x^3 + 8x^2 - x - 31; x + 3$

8)  $-x^3 + 7x^2 - 50; x - 5$                       9)  $8x^5 + 8x^4 - 3x^3 - x^2 - 2x + 1; x + 1$

Given a polynomial and one of its factors, find the remaining factors of the polynomial.

10)  $x^3 + 2x^2 - x - 2; (x - 1)$                       11)  $x^3 - x^2 - 10x - 8; (x + 1)$

12)  $x^3 + x^2 - 16x - 16; (x + 4)$                       13)  $x^3 - 6x^2 + 11x - 6; (x - 2)$

14)  $2x^3 - 5x^2 - 28x + 15; (x - 5)$                       15)  $3x^3 + 10x^2 - x - 12; (x + 3)$

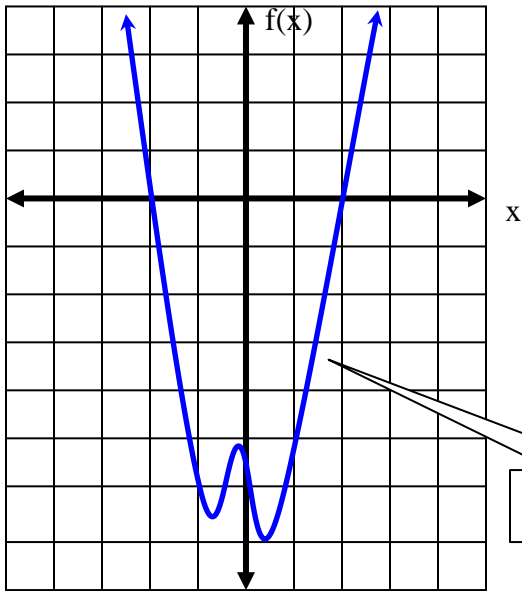
**EXERCISE B**

Given a polynomial and one of its factors, find the remaining factors of the polynomial.

16)  $2x^3 + 7x^2 - 53x - 28; (2x + 1)$                       17)  $2x^3 + 17x^2 + 23x - 42; (2x + 7)$

18)  $16x^5 - 32x^4 - 81x + 162; (x - 2)$                       19)  $x^4 - 5x^3 + 8x - 40; (x - 5)$

## EXERCISE C



20) Use the graph of the polynomial function to the left to determine at least one binomial factor of the polynomial. Then use synthetic division to find all the factors of the polynomial.

$$f(x) = x^4 - 3x^2 - 4$$

### ANSWERS:

1) -9, 54

7) no, R = -10

11)  $(x - 4)(x + 2)$

17)  $(x - 1)(x + 6)$

3) 14, -42

9) no, R = 1

13)  $(x - 3)(x - 1)$

19)  $(x + 2)(x^2 - 2x + 4)$

5) 422, 3110

15)  $(x - 1)(3x + 4)$