

7-4

Skills Practice

The Remainder and Factor Theorems

Use synthetic substitution to find $f(2)$ and $f(-1)$ for each function.

1. $f(x) = x^2 + 6x + 5$

21, 0

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

-2, 1

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

3, 3

7. $f(x) = x^3 - 3x^2 + x - 2$

-4, -7

9. $f(x) = x^4 + 2x^2 - 9$

15, -6

11. $f(x) = x^5 - 7x^3 - 4x + 10$

-22, 20

2. $f(x) = x^2 - x + 1$

3, 3

4. $f(x) = x^3 + 2x^2 + 5$

21, 6

6. $f(x) = x^3 + 6x^2 + x - 4$

30, 0

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

-8, 1

10. $f(x) = x^4 - 3x^3 + 2x^2 - 2x + 6$

2, 14

12. $f(x) = x^6 - 2x^5 + x^4 + x^3 - 9x^2 - 20$

-32, -26

Given a polynomial and one of its factors, find the remaining factors of the polynomial. Some factors may not be binomials.

13. $x^3 + 2x^2 - x - 2; x + 1$

 $x-1, x+2$

14. $x^3 + x^2 - 5x + 3; x - 1$

 $x-1, x+3$

15. $x^3 + 3x^2 - 4x - 12; x + 3$

 $x-2, x+2$

16. $x^3 - 6x^2 + 11x - 6; x - 3$

 $x-1, x-2$

17. $x^3 + 2x^2 - 33x - 90; x + 5$

 $x+3, x-4$

18. $x^3 - 6x^2 + 32; x - 4$

 $x-4, x+2$

19. $x^3 - x^2 - 10x - 8; x + 2$

 $x+1, x-4$

20. $x^3 - 19x + 30; x - 2$

 $x+5, x-3$

21. $2x^3 + x^2 - 2x - 1; x + 1$

 $2x+1, x-1$

22. $2x^3 + x^2 - 5x + 2; x + 2$

 $x-1, 2x-1$

23. $3x^3 + 4x^2 - 5x - 2; 3x + 1$

 $x-1, x+2$

24. $3x^3 + x^2 + x - 2; 3x - 2$

 $x^2 + x + 1$