

7-2 Practice

The Fundamental Theorem of Algebra

Find all the complex roots of each equation.

1. $x^5 - 3x^4 - 8x^3 - 8x^2 - 9x - 5 = 0$

2. $x^3 - 2x^2 + 4x - 8 = 0$

3. $x^3 + x^2 - x + 2 = 0$

4. $x^4 - 2x^3 - x^2 - 4x - 6 = 0$

5. $x^4 + 3x^3 - 21x^2 - 48x + 80 = 0$

6. $x^5 - 3x^4 + x^3 + x^2 + 4 = 0$

Find all the zeros of each function.

7. $y = 5x^3 - 5x$

8. $f(x) = x^3 - 16x$

9. $g(x) = 12x^3 - 2x^2 - 2x$

10. $y = 6x^3 + x^2 - x$

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

12. $y = -4x^3 + 100x$

For each equation, state the number of complex roots, the possible number of real roots, and the possible rational roots.

13. $2x^2 + 5x + 3 = 0$

14. $3x^2 + 11x - 10 = 0$

15. $2x^4 - 18x^2 + 5 = 0$

16. $4x^3 - 12x + 9 = 0$

17. $6x^5 - 28x + 15 = 0$

18. $x^3 - x^2 - 2x + 7 = 0$

19. $x^3 - 6x^2 - 7x - 12 = 0$

20. $2x^4 + x^2 - x + 6 = 0$

21. $4x^5 - 5x^4 + x^3 - 2x^2 + 2x - 6 = 0$

22. $7x^6 + 3x^4 - 9x^2 + 18 = 0$

23. $5 + x + x^2 + x^3 + x^4 + x^5 = 0$

24. $6 - x + 2x^3 - x^3 + x^4 - 8x^5 = 0$

Find the number of complex roots for each equation.

25. $x^8 - 5x^6 + x^4 + 2x - 16 = 0$

26. $x^{10} - 100 = 0$

27. $2x^4 + x^3 - 3x^2 + 4x - 2 = 0$

28. $-4x^3 + x^2 - 3x + 10 = 0$

29. $x^6 + 2x^5 + 3x^4 + 4x^3 + 5x^2 + 6x + 10 = 0$

30. $-3x^5 + 4x^4 + 5x^2 - 15 = 0$