

A2 Solving Polynomial Equations by Factoring

I. Solve by factoring.

1. $x(x-1)^2(x+1)^3 = 0$

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

3. $12x^3 + 4x^2 + 3x + 1 = 0$

4. $x^5 + 2x^4 + 3x^2 - 12 = x^5 + x^4 + 2x^2$

5. $(2x-1)(x^2+3)(2x^2-5) = 0$

6. $y^4 - 1 = 0$

7. $5x^6 = 9x^4 - 4x^2$

8. $15x^5 - 72x^3 - 108x = 0$

9. $x^6 - 4x^4 - 9x^2 + 36 = 0$

10. $4x^4 + 4x^2 = -1$

11. $x^7 - x^4 = 0$

12. $27x^4 + 54x^3 = x + 2$

13. $18x^3 = 50x$

14. $(2x+1)^2(2x^2+5x-1) = 0$

15. $x^6 - 64 = 0$ *DOS

II. Write a polynomial equation in standard form with integral coefficients given the roots.

16. 1, 3, -1/2

17. 0, 2 (multiplicity of 2)

18. $\sqrt{2}$, $-\sqrt{2}$, 4

ANSWERS

1. $x = 0, 1$ mult. 2, -1 mult. 3

3. $x = -\frac{1}{3}, \pm\frac{1}{2}i$

5. $x = \frac{1}{2}, \pm i\sqrt{3}, \pm\frac{\sqrt{10}}{2}$

7. $x = 0$ mult 2, $\pm 1, \pm\frac{2\sqrt{5}}{5}$

9. $x = \pm i\sqrt{3}, \pm\sqrt{3}, \pm 2$

11. $x = 0$ mult. 4, $1, \frac{-1 \pm i\sqrt{3}}{2}$

13. $x = 0, \pm\frac{5}{3}$

15. $x = \pm 2, -1 \pm i\sqrt{3}, 1 \pm i\sqrt{3}$

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

2. $x = 0, 1$ mult. 2

4. $x = \pm\sqrt{3}, \pm 2i$

6. $x = \pm 1, \pm i$

8. $x = 0, \pm\sqrt{6}, \pm\frac{i\sqrt{30}}{5}$

10. $x = \frac{i\sqrt{2}}{2}$ mult. 2, $-\frac{i\sqrt{2}}{2}$ mult. 2

12. $x = -2, -\frac{1}{3}, \frac{1}{6} \pm \frac{\sqrt{3}}{6}i$

14. $x = -\frac{1}{2}$ mult 2, $\frac{-5 \pm \sqrt{33}}{4}$

16. $2x^3 - 7x^2 + 2x + 3 = 0$

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