

State the degree and the leading coefficient of each polynomial.

1. $4a^5 - 3a^7 + a^2$

2. $4 - 3a^2 - a^5 + 2a^4$

Write a polynomial equation of least degree for each set of roots.

3. $3i, -3i, 2$

4. $1, -1, 2, -2$

State the number of complex roots of each equation.

5. $3a^2 - a^4 + 2a^3$

6. $15 - 2x + x^2$

Solve by completing the square.

7. $2x^2 + 4x - 12 = 0$

Find the discriminant, describe the nature of the roots, then use the quadratic formula to solve the equation.

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

Use the Remainder Theorem to see if the binomial is a factor of the polynomial.

9. $(2x^3 - 3x^2 - 10x + 3) \div (x - 3)$

10. $(x^3 + x^2 - 10) \div (x + 3)$

Divide using synthetic division

11. $(x^2 - 5x - 12) \div (x - 3)$

12. $(2x^3 + 3x^2 - 8x + 3) \div (x + 3)$

Use synthetic division to find all the factors of the polynomial.

13. $(x^3 + 6x^2 - 9x - 54) \div (x - 3)$