

Solving Equations
Emphasis solving Polynomials – Rational Root Theorem

Identify the possible Rational Roots of the given equations:

<p>1. $x^4 - 5x^2 - 36 = 0$ $q = 36 : 1, 2, 3, 4, 6, 9, 12, 18, 36$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 9, \pm 12, \pm 18, \pm 36}$</p>	<p>2. $x^3 + 3x^2 - 14x - 20 = 0$ $q = 20 : 1, 2, 4, 5, 10, 20$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 2, \pm 4, \pm 5, \pm 10, \pm 20}$</p>
<p>3. $x^3 - 2x^2 + 3x - 6 = 0$ $q = 6 : 1, 2, 3, 6$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 2, \pm 3, \pm 6}$</p>	<p>4. $x^4 - 14x^2 + 45 = 0$ $q = 45 : 1, 3, 5, 9, 15, 45$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 3, \pm 5, \pm 9, \pm 15, \pm 45}$</p>
<p>5. $x^4 + 6x^2 + 8 = 0$ $q = 8 : 1, 2, 4, 8$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 2, \pm 4, \pm 8}$</p>	<p>6. $x^4 + 3x^2 - 18 = 0$ $q = 18 : 1, 2, 3, 6, 9, 18$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 2, \pm 3, \pm 6, \pm 9, \pm 18}$</p>
<p>7. $x^3 - 1 = 0$ $q = 1$ $p = 1$ $S_0 : \boxed{\pm 1}$</p>	<p>8. $x^3 + 3x^2 - x - 3 = 0$ $q = 3 : 1, 3$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 3}$</p>
<p>9. $x^3 - 2x^2 - 3x + 6 = 0$ $q = 6 : 1, 2, 3, 6$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 2, \pm 3, \pm 6}$</p>	<p>10. $x^6 - 2x^4 - 4x^2 + 8 = 0$ $q = 8 : 1, 2, 4, 8$ $p = 1$ $S_0 : \boxed{\pm 1, \pm 2, \pm 4, \pm 8}$</p>

$$11. x^5 + 2x^4 + 11x^3 + 22x^2 + 24x + 48 = 0$$

$$q = 48 : 1, 2, 3, 4, 6, 8, 12, 16, 24, 48$$

$$p = 1$$

So:

$$\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 16, \pm 24, \pm 48$$

$$12. x^6 + 5x^4 - 4x^2 - 20 = 0$$

$$q = 20 : 1, 2, 4, 5, 10, 20$$

$$p = 1$$

$$So: \pm 1, \pm 2, \pm 4, \pm 5, \pm 10, \pm 20$$

$$13. x^6 - x^4 - x^2 + 1 = 0$$

$$q = 1$$

$$p = 1$$

$$So: \pm 1$$

$$14. x^8 - 26x^4 + 25 = 0$$

$$q = 25 : 1, 5, 25$$

$$p = 1$$

$$So: \pm 1, \pm 5, \pm 25$$

$$15. x^3 - 9x^2 + 33x - 25 = 0$$

$$q = 25 : 1, 5, 25$$

$$p = 1$$

$$So: \pm 1, \pm 5, \pm 25$$

$$16. x^3 + 2x^2 - 9x - 4 = 0$$

$$q = 4 : 1, 2, 4$$

$$p = 1$$

$$So: \pm 1, \pm 2, \pm 4$$

$$17. x^4 + 2x^3 - 7x^2 - 6x + 12 = 0$$

$$q = 12 : 1, 2, 3, 4, 6, 12$$

$$p = 1$$

$$So: \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$$

$$18. x^4 - 2x^3 - 6x^2 - 4x - 16 = 0$$

$$q = 16 : 1, 2, 4, 8, 16$$

$$p = 1$$

$$So: \pm 1, \pm 2, \pm 4, \pm 8, \pm 16$$

$$19. x^4 - x^3 - 5x^2 - 103x + 300 = 0$$

$$q = 300 : 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 25, 30, 50, 60, 75, 100, 150, 300$$

$$p = 1$$

$$So: \pm 1, \pm 2, \pm 3, \pm 4, \pm 5, \pm 6, \pm 10, \pm 12, \pm 15, \pm 20, \pm 25, \pm 30, \pm 50, \pm 60, \pm 75, \pm 100, \pm 150, \pm 300$$

$$20. x^4 + 2x^3 + 2x - 1 = 0$$

$$q = 1$$

$$p = 1$$

$$So: \pm 1$$