

A2.A.26: Solving Polynomial Equations: Find the solution to polynomial equations of higher degree that can be solved using factoring and/or the quadratic formula

- 1 Which values of x are solutions of the equation

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

- 1) 0, 1, 2
- 2) 0, 1, -2
- 3) 0, -1, 2
- 4) 0, -1, -2

- 2 What is the solution set of the equation

$$3x^5 - 48x = 0?$$

- 1) $\{0, \pm 2\}$
- 2) $\{0, \pm 2, 3\}$
- 3) $\{0, \pm 2, \pm 2i\}$
- 4) $\{\pm 2, \pm 2i\}$

- 3 Solve the equation $2x^3 - x^2 - 8x + 4 = 0$
algebraically for all values of x .

- 4 Solve the equation $8x^3 + 4x^2 - 18x - 9 = 0$
algebraically for all values of x .

- 5 Solve $x^3 + 5x^2 = 4x + 20$ algebraically.

- 6 Solve algebraically for all values of x :
 $x^4 + 4x^3 + 4x^2 = -16x$

- 7 Solve, giving 4 roots, $x^4 - 13x^2 + 36 = 0$

- 8 Solve: $x^4 - 3x^2 = 4$ (Find 4 roots.)

- 9 Solve: $x^4 + 4x^2 = 32$. Find 4 roots.

- 10 Find *four* roots of the following equation:
 $2x^4 + 5x^2 = 207$

A2.A.26: Solving Polynomial Equations: Find the solution to polynomial equations of higher degree that can be solved using factoring and/or the quadratic formula

Answer Section

1 ANS: 2

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

$$x(x^2 + x - 2) = 0$$

$$x(x + 2)(x - 1) = 0$$

$$x = 0, -2, 1$$

REF: 011103a2

2 ANS: 3

$$3x^5 - 48x = 0$$

$$3x(x^4 - 16) = 0$$

$$3x(x^2 + 4)(x^2 - 4) = 0$$

$$3x(x^2 + 4)(x + 2)(x - 2) = 0$$

REF: 011216a2

3 ANS:

$$x^2(2x - 1) - 4(2x - 1) = 0$$

$$(x^2 - 4)(2x - 1) = 0$$

$$(x + 2)(x - 2)(2x - 1) = 0$$

$$x = \pm 2, \frac{1}{2}$$

REF: 081537a2

4 ANS:

$$\pm \frac{3}{2}, -\frac{1}{2}$$

REF: fall0937a2

5 ANS:

$$x^3 + 5x^2 - 4x - 20 = 0$$

$$x^2(x + 5) - 4(x + 5) = 0$$

$$(x^2 - 4)(x + 5) = 0$$

$$(x + 2)(x - 2)(x + 5) = 0$$

$$x = \pm 2, -5$$

REF: 061437a2

6 ANS:

$$x^4 + 4x^3 + 4x^2 + 16x = 0$$

$$x(x^3 + 4x^2 + 4x + 16) = 0$$

$$x(x^2(x + 4) + 4(x + 4)) = 0$$

$$x(x^2 + 4)(x + 4) = 0$$

$$x = 0, \pm 2i, -4$$

REF: 061339a2

7 ANS:

$$\pm 2, \pm 3$$

REF: 089604a1

8 ANS:

$$\pm 2, \pm i$$

REF: 069407a1

9 ANS:

$$\pm 2, \pm 2i\sqrt{2}$$

REF: 089409a1

10 ANS:

$$\pm 3, \pm \frac{i\sqrt{46}}{2}$$

REF: 089812a1