Factorising Polynomials Answers

1 The Cubic Equation

1. (a) (i) $x^2 + x - 2$ (ii) $x^2 + 5x - 3$ (iii) $x^2 - 5x - 36$

   (b) (i) $x = 4,\ 1,\ -2$ (ii) $x = -3,\ 0.54,\ -5.54$

   (iii) $x = -4\frac{1}{2},\ -4,\ 9$

3. (a) $1,\ 0.59,\ 3.41$ (b) $-1,\ 6,\ -8$ (c) $\frac{1}{2},\ -3,\ 3$

4. 1 cm side

2 Cubic Equation: Number of Roots

1. (b) $x = -2.34$

2. one real root, $x = 1$, as $f(x) = (x-1)^3$

3. function $= (x-2)(x^2 + x + 1)$ and $x^2 + x + 1$ has no real roots

4. function $= (x-1)^2(x-2)$ so has 2 real roots, $x = 1, 2$

3 Factor Theorem

2. A : 2; C : 1; D : 3

3. (a) $(x-1)$ (b) $(x-2)$ (c) $(x-1)$ (d) $(2x+1)$ (e) $(3x-2)$

4 Factors of Higher Order Polynomials

1. (a) $x^3 + 5x^2 + 2x + 6$ (b) $x^3 - x - 5$

2. (a) $x^3 + 5x^2 + 4x + 1$ (b) $x^3 + x^2 - 6x - 3$

   (c) $2x^2 - 7$ (d) $3x^4 + x^3 - 6x^2 + 4x + 1$

3. (a) $-1,\ -3,\ -5,\ 1$ (b) $1,\ 2,\ -2,\ -9$

4. $-3,\ -1,\ 1$ (repeated), 2

5 Remainders

1. 40

2. (a) 7 (b) 61 (c) –488

3. $p = 3$

4. $p = -3,\ q = -10$

5. $(x+2),\ (x+8)$