

POLYNOMIALS

AS Unit 1: Pure Mathematics A

WJEC past paper questions: 2010 – 2017

Total marks available 93 (approximately 1 hour 50 minutes)

1. The polynomial $f(x)$ is defined by $f(x) = 2x^3 + 11x^2 + 4x - 5$
 - a) i) Evaluate $f(-2)$.
 - ii) **Using your answer to part (i)**, write down **one** fact which you can deduce about $f(x)$. (2)
 - b) Solve the equation $f(x) = 0$. (6)

(January 10)

2. a) Given that $x + 2$ is a factor of $12x^3 + kx^2 - 13x - 6$, write down an equation satisfied by k . Hence show that $k = 19$. (2)
 b) Factorise $12x^3 + 19x^2 - 13x - 6$. (3)
 c) Find the remainder when $12x^3 + 19x^2 - 13x - 6$ is divided by $2x - 1$. (2)

(Summer 10)

3. a) Find the remainder when $x^3 - 3$ is divided by $x + 2$. (2)
 b) Solve the equation $6x^3 + x^2 - 11x - 6 = 0$. (6)

(January 11)

4. The polynomial $px^3 - x^2 - 31x + q$ has $x + 2$ as a factor. When the polynomial is divided by $x - 1$, the remainder is -36 .
 - a) Show that $p = 6$ and $q = -10$. (6)
 - b) Factorise $6x^3 - x^2 - 31x - 10$. (3)

(Summer 11)

5. a) When $ax^3 - 21x - 10$ is divided by $x - 3$, the remainder is 35. Write down an equation satisfied by a , and hence show that $a = 4$. (2)
 b) Factorise $4x^3 - 21x - 10$. (5)

(January 12)

6. a) Solve the equation $6x^3 - 19x^2 + 11x + 6 = 0$. (6)
 b) When $x^3 - 53$ is divided by $x - a$, the remainder is 11. Find the value of the constant a . (2)

(Summer 12)

7. a) Given that $x + 2$ is a factor of $px^3 + 18x^2 - 4x - 8$, write down an equation satisfied by p . Hence show that $p = 9$. (2)
- b) Solve the equation $9x^3 + 18x^2 - 4x - 8 = 0$. (4)
- (January 13)
8. Solve the equation $8x^3 - 2x^2 - 7x + 3 = 0$. (6)
- (Summer 13)
9. a) When $ax^3 + 13x^2 - 10x - 24$ is divided by $x + 3$, the remainder is -39 . Write down an equation satisfied by a and hence show that $a = 6$. (2)
- b) Solve the equation $6x^3 + 13x^2 - 10x - 24 = 0$. (6)
- (January 14)
10. Solve the equation $6x^3 - 13x^2 + 4 = 0$. (6)
- (Summer 14)
11. a) Given that $x - 3$ is a factor of $px^3 - 13x^2 - 19x + 12$, write down an equation satisfied by p . Hence show that $p = 6$. (2)
- b) Solve the equation $6x^3 - 13x^2 - 19x + 12 = 0$. (4)
- (Summer 15)
12. The polynomial $f(x)$ is given by $f(x) = 8x^3 + 2x^2 - 41x + 10$
- a) Factorise $f(x)$. (5)
- b) Hence or otherwise, evaluate $f(2.25)$. (2)
- (Summer 16)
13. a) Given that $x - 2$ is a factor of $kx^3 + 2x^2 - 41x + 10$, write down an equation satisfied by k . Hence show that $k = 8$. (2)
- b) Factorise $8x^3 + 2x^2 - 41x + 10$. (3)
- c) Find the remainder when $8x^3 + 2x^2 - 41x + 10$ is divided by $2x + 1$. (2)
- (Summer 17)