

Year 1 Pure Chapter 7: Algebraic Division and Factor Theorem
Exam Questions (Total Marks 43)

1. $f(x) = 2x^3 - x^2 + px + 6,$

where p is a constant.

Given that $(x - 1)$ is a factor of $f(x)$, find

(a) the value of p ,

(2)

(b) the remainder when $f(x)$ is divided by $(2x + 1)$.

(2)

(Total 4 marks)

2.

$$f(x) = 2x^3 - 3x^2 - 39x + 20$$

- (a) Use the factor theorem to show that $(x + 4)$ is a factor of $f(x)$.

(2)

- (b) Factorise $f(x)$ completely.

(4)

(Total 6 marks)

3.

$$f(x) = 3x^3 - 5x^2 - 58x + 40$$

- (a) Find the remainder when $f(x)$ is divided by $(x - 3)$

(2)

Given that $(x - 5)$ is a factor of $f(x)$,

- (b) find all the solutions of $f(x) = 0$.

(5)

(Total 7 marks)

4.

$$f(x) = x^4 + 5x^3 + ax + b,$$

where a and b are constants.

The remainder when $f(x)$ is divided by $(x - 2)$ is equal to the remainder when $f(x)$ is divided by $(x + 1)$.

(a) Find the value of a .

(5)

Given that $(x + 3)$ is a factor of $f(x)$,

(b) find the value of b .

(3)

(Total 8 marks)

5. $f(x) = 2x^3 + ax^2 + bx - 6$

where a and b are constants.

When $f(x)$ is divided by $(2x - 1)$ the remainder is -5 .

When $f(x)$ is divided by $(x + 2)$ there is no remainder.

(a) Find the value of a and the value of b .

(6)

(b) Factorise $f(x)$ completely.

(3)

(Total 9 marks)

6. $f(x) = 6x^3 + px^2 + qx + 8$, where p and q are constants.

Given that $f(x)$ is exactly divisible by $(2x - 1)$, and also that when $f(x)$ is divided by $(x - 1)$ the remainder is -7 ,

(a) find the value of p and the value of q .

(6)

(b) Hence factorise $f(x)$ completely.

(3)

(Total 9 marks)