

1 $f(x) = 2x^3 - 7x^2 - 17x + 10$

Use the factor theorem and division to factorise $f(x)$ completely.

(Total for question 1 is 6 marks)

2 $g(x) = 4x^3 - 8x^2 - 35x + 75$

(a) Use the factor theorem to show that $(x + 3)$ is a factor of $g(x)$.

(2)

(b) Hence show that $g(x)$ can be written in the form $g(x) = (x + 3)(ax + b)^2$, where a and b are constants to be found.

(4)

(Total for question 2 is 6 marks)

3 $f(x) = x^3 + 6x^2 + px + q$

Given that $f(4) = 0$ and $f(-5) = 36$.

(a) Find the values of p and q .

(3)

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

(4)

(Total for question 3 is 7 marks)

4 $f(x) = 2x^3 - x^2 - 13x + 14$

(a) Use the factor theorem to show that $(x - 2)$ is a factor of $f(x)$.

(2)

(b) Hence, or otherwise, solve the equation $2x^3 - x^2 - 13x + 14 = 0$, giving your answers to 2 decimal places where appropriate.

(5)

(Total for question 4 is 7 marks)

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

(a) Given that $(x - 2)$ is a factor of $f(x)$, find the value of k .

(2)

(b) Solve the equation $f(x) = 0$.

(4)

(Total for question 5 is 6 marks)

6 $f(x) = x^3 + 6x^2 + 4x - 15$

(a) Use the factor theorem to show that $x = -3$ is a solution to $f(x) = 0$.

(2)

(b) Find the other solutions to the equation $f(x) = 0$, giving your answers to 2 decimal places.

(5)

(Total for question 6 is 7 marks)
