

Name: _____

Alevel Bridging Work - Week 7

Factor Theorem

Date: _____

Time: 44 minutes

Total marks available: 44

Total marks achieved: _____

Hello All! Wow you are doing amazing work 😊 Its great to see so many of you taking part in this bridging work, it will definitely help you when you return to school in September!!

Here are 8 real exam questions based on Week 6 work.

Once you have completed these questions, and you would like further learning, start to look into the meaning of DIFFERENTIATION ($\frac{dy}{dx}$). Use videos and make notes on this ready for September.

Miss Lambert
The King Edmund School

Questions

Q1.

$$f(x) = 4x^3 - 12x^2 + 2x - 6$$

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

(2)

(b) Hence show that 3 is the only real root of the equation $f(x) = 0$

(4)

(Total for question = 6 marks)

Q2.

Factorise fully $25x - 9x^3$

(3)

(Total 3 marks)

Q3.

(a) Factorise completely $x^3 + 10x^2 + 25x$

(2)

(b) Sketch the curve with equation

$$y = x^3 + 10x^2 + 25x$$

showing the coordinates of the points at which the curve cuts or touches the x -axis.

(2)

The point with coordinates $(-3, 0)$ lies on the curve with equation

$$y = (x + a)^3 + 10(x + a)^2 + 25(x + a)$$

where a is a constant.

(c) Find the two possible values of a .

(3)

(Total for question = 7 marks)

Q4.

$$f(x) = 2x^3 - 7x^2 + 4x + 4$$

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

(2)

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

(4)

(Total 6 marks)

Q5.

Factorise completely $x - 4x^3$

(3)

(Total 3 marks)

Q6.

$$f(x) = 2x^3 - 7x^2 - 10x + 24$$

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

(2)

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

(4)

(Total 6 marks)

Q7.

(a) Find the remainder when

$$x^3 - 2x^2 - 4x + 8$$

is divided by

(i) $x - 3$,

(ii) $x + 2$.

(3)

(b) Hence, or otherwise, find all the solutions to the equation

$$x^3 - 2x^2 - 4x + 8 = 0.$$

(4)

(Total 7 marks)

Q8.

$$f(x) = 3x^3 - 5x^2 - 16x + 12.$$

(a) Find the remainder when $f(x)$ is divided by $(x - 2)$.

(2)

Given that $(x + 2)$ is a factor of $f(x)$,

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

(4)

(Total 6 marks)