**JLL PST - Consolidation 14**

**Total Marks: 47**

**Question 18**

*[Edexcel C3 Jan 2007 Q8iib Edited]*

Given that

, and ,

It can be shown that

Hence evaluate . Give your answer in terms of .

**Correct answer:**

**Their answer:**

**(1 mark)**

**Question 1**

*[Edexcel C3 Jan 2007 Q1a Edited]*

By writing as , show that

where and are constants to be found.

**Correct answer:**

,

**Their answer:**

,

**(5 marks)**

**Question 2**

*[Edexcel C3 Jan 2007 Q1b Edited]*

It can be shown that

Given that , find the exact value of .

**Correct answer:**

**Their answer:**

**(2 marks)**

**Question 5**

*[Edexcel C3 Jan 2007 Q3b Edited]*

The curve *C* has equation *.*

It can be shown that the point lies on *C*.

Find the value of at .

**Correct answer:**

**Their answer:**

**(4 marks)**

**Question 6**

*[Edexcel C3 Jan 2007 Q3c Edited]*

The curve *C* has equation *.*

It can be shown that the point lies on *C*.

It is given that at .

Find an equation of the normal to *C* at . Give your answer in the form , where and are exact constants.

**Correct answer:**

**Their answer:**

**(4 marks)**

**Question 7**

*[Edexcel C3 Jan 2007 Q4i]*

The curve *C* has equation .

Use calculus to find the coordinates of the turning points of *C*.

**Correct answer:**

, or ,

**Their answer:**

, or ,

**(6 marks)**

**Question 8**

*[Edexcel C3 Jan 2007 Q4ii]*

Given that , find the value of at .

**Correct answer:**

**Their answer:**

**(5 marks)**

**Question 9**

*[Edexcel C3 Jan 2007 Q5a]*

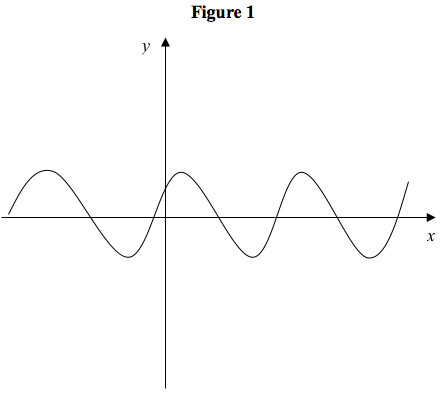


Figure 1 shows an oscilloscope screen.

The curve on the screen satisfies the equation *.*

Express the equation of the curve in the form , where and are constants, and .

*Input note: give your answers as exact values.*

**Correct answer:**

,

**Their answer:**

,

**(4 marks)**

**Question 10**

*[Edexcel C3 Jan 2007 Q5b Edited]*

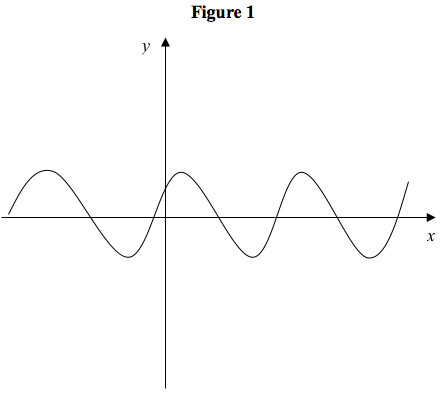


Figure 1 shows an oscilloscope screen.

The curve on the screen satisfies the equation *.*

It can be shown that

Find the values of , , for which .

*Input note: give your solutions as exact values.*

**Correct answer:**

or

**Their answer:**

or

**(4 marks)**

**Question 11**

*[Edexcel C3 Jan 2007 Q6a Edited]*

The function is defined by

, and

Find the inverse function of .

**(4 marks)**

**Question 12**

*[Edexcel C3 Jan 2007 Q6b Edited]*

The function is defined by

, and

It can be shown that

Write down the range of .

**Correct answer:**

**Their answer:**

**(1 mark)**

**Question 13**

*[Edexcel C3 Jan 2007 Q6d Edited]*

The function is defined by

, and

It can be shown that

The graph of crosses the graph of at .

The iterative formula

,

is used to find an approximate value for .

Calculate the values of and , giving your answer to 4 decimal places.

**Correct answer:**

-0.3704 and -0.3452

**Their answer:**

-0.3704 and -0.3452

**(2 marks)**

**Question 15**

*[Edexcel C3 Jan 2007 Q7c]*

Given that , find the values of the constants , and .

**Correct answer:**

, ,

**Their answer:**

, ,

**(3 marks)**

**Question 17**

*[Edexcel C3 Jan 2007 Q8iia]*

Given that

, and ,

express in terms of .

**(2 marks)**