**Year 13 Consolidation 11**

**Total Marks: 55**

**Question 2**

*[Edexcel C3 Jan 2006 Q3]*

The point lies on the curve with equation . The -coordinate of is 3.

Find an equation of the normal to the curve at the point in the form , where and are constants.

**Correct answer:**

**Their answer:**

 **(5 marks)**

**Question 3**

*[Edexcel C3 Jan 2006 Q4ai]*

Differentiate with respect to

**Correct answer:**

**Their answer:**

 **(4 marks)**

**Question 4**

*[Edexcel C3 Jan 2006 Q4aii]*

Differentiate with respect to

**Correct answer:**

**Their answer:**

 **(4 marks)**

**Question 5**

*[Edexcel C3 Jan 2006 Q4b]*

Given that , find in terms of .

 **(5 marks)**

**Question 6**

*[Edexcel C3 Jan 2006 Q6a Edited]*

Given that , where and , find the value of and the value of .

*Input note: give both values correct to 1 decimal place.*

**Correct answer:**

 12.6 and 18.4

**Their answer:**

 12.6 and 18.4

 **(4 marks)**

**Question 7**

*[Edexcel C3 Jan 2006 Q6b Edited]*

It can be shown that

Hence solve the equation

for , giving your answers to one decimal place.

**Correct answer:**

 38.0 and 285.2

**Their answer:**

 38.0 and 285.2

 **(5 marks)**

**Question 8**

*[Edexcel C3 Jan 2006 Q6ci Edited]*

It can be shown that

Write down the minimum value of .

**Correct answer:**

**Their answer:**

 **(1 mark)**

**Question 9**

*[Edexcel C3 Jan 2006 Q6cii Edited]*

It can be shown that

Find, to 2 decimal places, the smallest positive value of for which the minimum value of occurs.

**Correct answer:**

 161.57

**Their answer:**

 161.57

 **(2 marks)**

**Question 10**

*[Edexcel C3 Jan 2006 Q7ai Edited]*

Express

where ,

in terms of and only.

**Correct answer:**

**Their answer:**

 **(2 marks)**

**Question 11**

*[Edexcel C3 Jan 2006 Q7aii Edited]*

Show that

where is a constant to be found.

**Correct answer:**

**Their answer:**

 **(3 marks)**

**Question 12**

*[Edexcel C3 Jan 2006 Q7c]*

Solve, for ,

giving your answers in terms of .

**Correct answer:**

 or or or

**Their answer:**

 or or or

 **(4 marks)**

**Question 13**

*[Edexcel C3 Jan 2006 Q8a Edited]*

The functions and are defined by

,

,

Find the composite function in the form

**Correct answer:**

**Their answer:**

 **(4 marks)**

**Question 14**

*[Edexcel C3 Jan 2006 Q8c Edited]*

The functions and are defined by

,

,

It can be shown that

Write down the range of .

**Correct answer:**

**Their answer:**

 **(1 mark)**

**Question 15**

*[Edexcel C3 Jan 2006 Q8d Edited]*

The functions and are defined by

,

,

It can be shown that

Find the value of for which , giving your answer to 3 significant figures.

 **(4 marks)**

**Question 1**

*[Edexcel C3 Jan 2006 Q2]*

Express

as a single fraction in its simplest form.

**Correct answer:**

**Their answer:**

 **(7 marks)**