6664

Past Paper

This resource was created and owned by Pearson Edexcel

Surname	Other n	ames
Pearson Edexcel GCE	Centre Number	Candidate Number
Core Mat		s C2
Advanced Subsid	iary	
Wednesday 24 May 2017 Time: 1 hour 30 minute	7 – Morning	Paper Reference <b>6664/01</b>

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

### Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B). Coloured pencils and highlighter pens must not be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided
   there may be more space than you need.
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- When a calculator is used, the answer should be given to an appropriate degree of accuracy.

### Information

- The total mark for this paper is 75.
- The marks for each question are shown in brackets
   use this as a quide as to how much time to spend on each question.

### **Advice**

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶







6664

Doot	Donor	
Pasi	Paper	

**www.mystudybro.com**This resource was created and owned by Pearson Edexcel

Leave	
blank	

1. Find the first 4 terms, in ascending powers of $x$ , of the binomial expansion of	f			
$\left(3-\frac{1}{3}x\right)^5$				
giving each term in its simplest form.  (4)				

DO NOT WRITE IN THIS AREA

Sum	mer	201	7

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Summer 2017	www.mystudybro.com	Mathematics C2
Past Paper	This resource was created and owned by Pearson Edexcel	6664
		Leave blank

	Question 1 continued	blank
Q1		
Q1		
QI		
Q1		
<u>Q1</u>		
		Q1

(Total 4 marks)

•	In the triangle ABC, $AB = 16$ cm, $AC = 13$ cm, angle $ABC = 50^{\circ}$ and angle $BCA = x^{\circ}$	
	Find the two possible values for $x$ , giving your answers to one decimal place.	(4)
_		

Sum	mer	201	7

Summer 2017	This resource was created and owned by Pearson Edexce	Mathematics C
Past Paper	This resource was created and owned by Pearson Edexce	
		Leave blank
Question 2 continu	red	biank
Question 2 continu	icu	

Q2

(Total 4 marks)



Past Paper

Leave blank

3. (a) 
$$y = 5^x + \log_2(x+1), \quad 0 \le x \le 2$$

Complete the table below, by giving the value of y when x = 1

x	0	0.5	1	1.5	2
у	1	2.821		12.502	26.585

**(1)** 

(b) Use the trapezium rule, with all the values of y from the completed table, to find an approximate value for

$$\int_0^2 \left(5^x + \log_2(x+1)\right) \mathrm{d}x$$

giving your answer to 2 decimal places.

**(4)** 

(c) Use your answer to part (b) to find an approximate value for

$$\int_0^2 (5 + 5^x + \log_2(x+1)) \, \mathrm{d}x$$

giving your answer to 2 decimal places.

**(1)** 

٥.				24	١.	7
Sι	ım	m	er	20	11	1

Past	Paper

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**www.mystudybro.com**This resource was created and owned by Pearson Edexcel

ı	ı	C	ı	I	•	a	u	. I	L	•	3	•	·	,	4
												_	_	_	

estion 3 continued		

Past Paper

	Leave blank
Question 3 continued	Ulalik

Past Paper

	Leave blank
Question 3 continued	
	<b>Q3</b>
(Total 6 marks)	



Leave blank

DO NOT WRITE IN THIS AREA

**DO NOT WRITE IN THIS AREA** 

4.

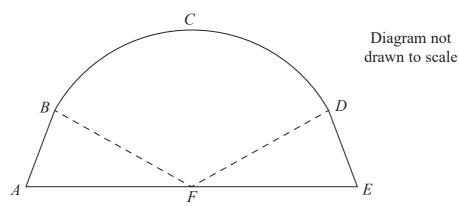


Figure 1

Figure 1 is a sketch representing the cross-section of a large tent ABCDEF. AB and DE are line segments of equal length.

Angle FAB and angle DEF are equal.

F is the midpoint of the straight line AE and FC is perpendicular to AE. BCD is an arc of a circle of radius 3.5 m with centre at F. It is given that

$$AF = FE = 3.7 \text{m}$$
  
 $BF = FD = 3.5 \text{m}$   
angle  $BFD = 1.77 \text{ radians}$ 

Find

(a) the length of the arc BCD in metres to 2 decimal places,

**(2)** 

(b) the area of the sector *FBCD* in m<sup>2</sup> to 2 decimal places,

**(2)** 

(c) the total area of the cross-section of the tent in m<sup>2</sup> to 2 decimal places.

**(4)** 

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**www.mystudybro.com**This resource was created and owned by Pearson Edexcel

	6664

uestion 4 continued	

Past Paper

## www.mystudybro.com

**Mathematics C2** 

== =	<b>,</b>		
This resource was	created and	owned by Pearson	n Edexcel

	DO
	NOT
	WRITE
	Ē
	SIHI
	AREA

6664 Leave

Z	
0	
7	
5	
7	
$\simeq$	
Ш	
=	
$\dashv$	
工	
V	

Question 4 continued	blank
Question I continued	

st Paper	This resource was created and owned by Pearson Edexcel	6664
		Leave
Question 4 continue	Ч	blank
Question 4 continue	u	
		Q4
	(Total 8 ms	arks)



Leave blank

The circle *C* has equation

$$x^2 + y^2 - 10x + 6y + 30 = 0$$

Find

(a) the coordinates of the centre of C,

**(2)** 

(b) the radius of C,

**(2)** 

(c) the y coordinates of the points where the circle C crosses the line with equation x = 4, giving your answers as simplified surds.

**(3)** 

Paper	This resource was created and owned by Pearson Edexcel	
		L
Question 5 continue	ad	b
Question 3 continu	tu e e e e e e e e e e e e e e e e e e e	
		Q:
	(Total 7 ma	rks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

■ Past Paper

6.

 $f(x) = -6x^3 - 7x^2 + 40x + 21$ 

(a) Use the factor theorem to show that (x + 3) is a factor of f(x)

(2)

(b) Factorise f(x) completely.

**(4)** 

(c) Hence solve the equation

$$6(2^{3y}) + 7(2^{2y}) = 40(2^y) + 21$$

giving your answer to 2 decimal places.

**(3)** 

_			
Sun	nmer	· 201	7

Doot	Paper
<b>F</b> 451	Fauer

**www.mystudybro.com**This resource was created and owned by Pearson Edexcel

|--|

estion 6 continued	

# www.mystudybro.com

**Mathematics C2** 

	······································
ast Paper	This resource was created and owned by Pearson Edexcel

aı	.IC	3	C.	_
		6	66	4

ı	
	DO
	NOT
	WRIT
	Z
	SIHT
	AREA

-4	ρ
-	•
r	7
٧.	
-	•
-	_
	-
	_
ES.	,
100	2
_	۹
	г
d	b
-	
_	
_	_
_	
ы	ľ
-	_
_	-
-	
-4	ρ
⋖	
-	
_	г
-	L
	-
10 /	a
U	r
$\overline{}$	
-	
т	3
e p	P
=	_
-9	۴
d	ь
	3
п	ř
	ı
100	
)	9
e di	ø

Question 6 continued	b	olank

$\overline{}$
ш
$\equiv$
=
2
=
$\leq$
$\vdash$
0
$\overline{}$
0
_
_
A
A
ш
R
R
ARE
SARE
ARE
<b>IS ARE</b>
<b>HIS ARE</b>
<b>HIS ARE</b>
<b>ITHIS ARE</b>
<b>HIS ARE</b>
<b>ITHIS ARE</b>
<b>ITHIS ARE</b>
IN THIS ARE
<b>TE IN THIS ARE</b>
<b>RITE IN THIS ARE</b>
<b>RITE IN THIS ARE</b>
<b>IN THIS ARE</b>
<b>NRITE IN THIS ARE</b>
<b>VRITE IN THIS ARE</b>
T WRITE IN THIS ARE
<b><i>OT WRITE IN THIS ARE</i></b>
<b>OT WRITE IN THIS ARE</b>
<b>JOT WRITE IN THIS ARE</b>
<b>IOT WRITE IN THIS ARE</b>
NOT WRITE IN THIS ARE
O NOT WRITE IN THIS ARE
<b>30 NOT WRITE IN THIS ARE</b>
O NOT WRITE IN THIS ARE

	Lea
Question 6 continued	bla
Question o continued	
	Q6
	 ٧٥
	4 /



$2\log(x + a) = \log(16a^6)$ , where a is a positive constant	
$2\log(x + a) = \log(16a^6)$ , where a is a positive constant	
Find $x$ in terms of $a$ , giving your answer in its simplest form.	(3
	(-
$\log_3(9y + b) - \log_3(2y - b) = 2$ , where b is a positive constant	
Find $y$ in terms of $b$ , giving your answer in its simplest form.	
	(4

⋖	
S	
Ξ	
_	
Ш	
ᆮ	
<b>8</b>	
Z	
0	
_	

Question 7 continued	Leave
	07
	Q7
(Total 7 marks)	



■ Past Paper

Leave blank

**DO NOT WRITE IN THIS AREA** 

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**8.** (a) Show that the equation

$$\cos^2 x = 8\sin^2 x - 6\sin x$$

can be written in the form

$$(3\sin x - 1)^2 = 2$$

(3)

(b) Hence solve, for  $0 \le x < 360^{\circ}$ ,

$$\cos^2 x = 8\sin^2 x - 6\sin x$$

giving your answers to 2 decimal places.

**(5)** 

Paper	This resource was created and owned by Pearson Edexcel	66
		Lea
Question 8 continue	d	blar
Question o continue	u	
		—
		Q8
	(Total 8 ma	arks)



blank

The first three terms of a geometric sequence are

$$7k-5$$
,  $5k-7$ ,  $2k+10$ 

where k is a constant.

(a) Show that 
$$11k^2 - 130k + 99 = 0$$

**(4)** 

Given that k is not an integer,

(b) show that 
$$k = \frac{9}{11}$$

**(2)** 

For this value of k,

- (c) (i) evaluate the fourth term of the sequence, giving your answer as an exact fraction,
  - (ii) evaluate the sum of the first ten terms of the sequence.

**(6)** 


t Paper	This resource was created and owned by Pearson Edexcel	666
		Leave
0		blank
Question 9 continued		



## www.mystudybro.com

**Mathematics C2** 

ast Paner	This resource was created and owned by Pearson Edexce

2	61	

DO NOT
WRITE
SIHT NI
AREA

C	7
C	
2	2
<u>_</u>	5
_	ł
5	1
7	i
	i
п	ï
4	-
Ξ	1
	=

Question 9 continued	Leave blank

Summer	201
Past Paper	

	ummer 201 <i>7</i>	www.mystuaypro.com	Mathematics C
Pa	ast Paper	This resource was created and owned by Pearson Edexcel	66
			Leav
			blan
	Question 9 continued	l	
⋖			
THIS AREA			
A			
=			
F			
DO NOT WRITE IN			
H			
<u>R</u>			
>			
5			
Z			
9			
⋖			
AREA			
A			
THIS			
<del></del>			
2			
쁜			
~			
DO NOT WRITE IN			
6			
ž			
9			
EA			
A A			
S			
王			
DO NOT WRITE IN THIS AREA			
N N			
<b>&gt;</b>			
0			
2			
D			

**Q**9

(Total 12 marks)



Leave blank

**DO NOT WRITE IN THIS AREA** 

**DO NOT WRITE IN THIS AREA** 

DO NOT WRITE IN THIS AREA

Past Paper

10.

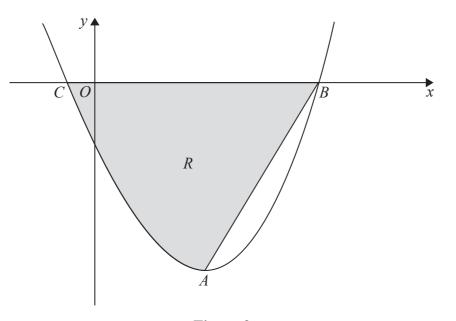


Figure 2

Figure 2 shows a sketch of part of the curve with equation

$$y = 4x^3 + 9x^2 - 30x - 8$$
,  $-0.5 \le x \le 2.2$ 

The curve has a turning point at the point A.

(a) Using calculus, show that the x coordinate of A is 1

**(3)** 

The curve crosses the x-axis at the points B(2, 0) and  $C\left(-\frac{1}{4}, 0\right)$ 

The finite region R, shown shaded in Figure 2, is bounded by the curve, the line AB, and the *x*-axis.

(b) Use integration to find the area of the finite region R, giving your answer to 2 decimal places.

**(7)** 

t Paper	This resource was created and owned by Pearson Edexcel	666
		Leave
Question 10 cont	inued	blank
Question 10 cont	mucu	



## www.mystudybro.com

**Mathematics C2** 

Odiffici Zoff	www.mystaaybro.com	Matriciliatio
Past Paper	This resource was created and owned by Pearson Edexc	el

Question 10 continued	blank

Paper	This resource was created and owned by Pearson Edexcel	6
		Lea
Question 10 continu	ned	bla
Question to contint	icu	



Question 10 continued

Summer 2017	www.mystudybro.com	Mathematics	C2	
Past Paper	This resource was created and owned by Pearson Edexcel		6664	
		Lea	ave	
		1,1,0	1-	

	blank	
		O N
		DO NOT WRITE IN THIS AREA
		VRIT
		E
		IHI
		AR
		EA
		NON
		OT V
		DO NOT WRITE IN THIS AREA
		E
		Ξ
		S AR
		EA
		DO I
		TON
		WRI
		IE
		Ŧ
	Q10	DO NOT WRITE IN THIS ARE
		REA
5		

(Total 10 marks) **TOTAL FOR PAPER: 75 MARKS** 

**END** 

