

Diagram **NOT** accurately drawn

Figure 2

The region R, shown shaded in Figure 2, is bounded by the curve with equation  $y = x^2 + 1$  and the curve with equation  $x^2 + y^2 = 11$ 

The two curves intersect at the point A and at the point B.

(a) Find the x coordinate of the point A and the x coordinate of the point B.

**(4)** 

The region R is rotated through 360° about the x-axis.

(b) Use algebraic integration to find the volume, to 2 decimal places, of the solid generated.

(5)


Ques	stion 10 continued	



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Question 10 continued

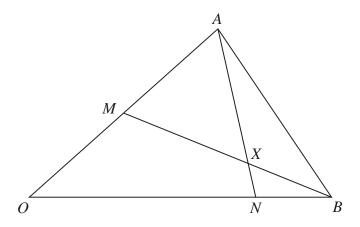


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Figure 3

Figure 3 shows triangle  $\overrightarrow{OAB}$  with  $\overrightarrow{OA} = \mathbf{a}$  and  $\overrightarrow{OB} = \mathbf{b}$ 

M is the midpoint of OA.

N is the point on OB such that ON:NB = 3:1

The lines AN and BM intersect at the point X.

- (a) Find expressions, in terms of a and b, for
  - (i)  $\overrightarrow{AN}$
- (ii)  $\overrightarrow{BM}$

(3)

(b) Using a vector method, find AX:XN

(7)



	Question 11 continued
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Question 11 continued		
	(Total for Question 11 is 10 marks)	
	TOTAL FOR PAPER IS 100 MARKS	

