- **10** Given that $2\log_y x + 2\log_x y = 5$
 - (a) show that $\log_y x = \frac{1}{2}$ or $\log_y x = 2$

(5)

(b) Hence, or otherwise, solve the equations

$$xy = 27$$

$$2\log_y x + 2\log_x y = 5$$

(6)

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Question 10 continued		



Question 10 continued

Question 10 co	ntinued			
		(Total for Questi	ion 10 is 11 marks	6



11

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

(a) Write f(x) in the form $P - Q(x + R)^2$, where P, Q and R are rational numbers.

(2)

The curve *C* has equation $y = 4 + 3x - x^2$

(b) Find the coordinates of the maximum point of C.

(1)

The line l_1 is a tangent to C at the point where x = 1

(c) Find an equation for l_1

(5)

Another line l_2 is perpendicular to l_1 and is also a tangent to C.

The lines l_1 and l_2 intersect at the point A.

(d) Find the coordinates of A.

(5)

The point *B* with coordinates (-3, 2) lies on l_1

(e) Find the exact length of AB.

(2)

The point D with coordinates (8, 0) lies on l_2

(f) Find the exact area of triangle ABD.

(3)





Question 11 continued			



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