- The *n*th term of an arithmetic series is t_n and the sum of the first *n* terms of the series is S_n . Given that $S_2 = \frac{2}{3}t_5$ and that $S_4 = t_{10} + 3$
 - (a) find
 - (i) the common difference of the series,
 - (ii) the first term of the series.

(5)

Given also that $S_{p+2} - S_p = 110$

(b) find the value of p.

(3)



5 Using the identities

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$
$$\tan A = \frac{\sin A}{\cos A}$$

(a) show that the equation

$$3\sin(x+\alpha) = 5\sin(x-\alpha)$$

can be written in the form $\tan x = 4 \tan \alpha$

(5)

(b) Hence solve, to the nearest integer, the equation

$$3\sin(2y+30)^\circ = 5\sin(2y-30)^\circ$$
 for $90 \le y < 180$ (4)

Question 5 continued			



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Question 5 continued	



- Solve
 - (a) $\log_x 1024 = 5$

(2)

(b) $\log_3 (7y - 3) = 4$

(2)

(c) $\log_a 25 + 2\log_a 625 = 10$

(3)

(d) $\log_b 7 - 2\log_7 b + 1 = 0$

(5)

Question 6 continued		



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Question 6 continued	

