

11

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

- (a) (i) Using the above identity, show that

$$\cos 2x = 1 - 2\sin^2 x$$

- (ii) Hence show that

$$\frac{13\sin x - 2\cos 2x - 10}{4\sin x - 3} = 4 + \sin x \quad (7)$$

- (b) Hence solve, in radians to 3 significant figures, the equation

$$10 + 2\cos\left(2\theta + \frac{\pi}{3}\right) - 13\sin\left(\theta + \frac{\pi}{6}\right) = 2\sin\left(\theta + \frac{\pi}{6}\right) + 8$$

$$\text{for } \pi \leq \theta \leq 2\pi \quad (5)$$

- (c) Find the exact value of

$$\int_0^{\frac{\pi}{2}} \left( \frac{13\sin x - 2\cos 2x - 10 + 4x\sin x - 3x}{4\sin x - 3} \right) dx \quad (5)$$

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



**Question 11 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



P 5 5 8 8 5 A 0 3 3 3 6

**Question 11 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



**Question 11 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



P 5 5 8 8 5 A 0 3 5 3 6

**Question 11 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

---

(Total for Question 11 is 17 marks)

---

**TOTAL FOR PAPER IS 100 MARKS**

