eClassroom

Question 1

Sketch the curve C with equation:

$$y = \sin(x - 30^\circ), \quad -360^\circ \leq x \leq 360^\circ.$$

(a) Write down the exact coordinates of the points at which C meets the two coordinate axes.
(3 marks)

(b) Solve, for $-360^\circ \leq x \leq 360^\circ$,

$$4\sin(x - 30^\circ) = \sqrt{6} - \sqrt{2},$$

showing each stage of your working.
(5 marks)

Total for question = 8 marks

Question 2

Sketch the curve C with equation:

$$y = 2\cos x, \quad -360^\circ \leq x \leq 360^\circ.$$

(a) Write down the exact coordinates of the points at which C meets the two coordinate axes.
(3 marks)

(b) Solve, for $-360^\circ \leq x \leq 360^\circ$,

$$2\cos x = 1,$$

showing each stage of your working.
(5 marks)

Total for question = 8 marks

Question 3

Sketch the curve C with equation:

$$y = -\tan x, \quad 0 \leq x \leq 2\pi.$$

(a) Write down the exact coordinates of the points at which C meets the two coordinate axes.
(3 marks)

(b) Solve, for $0 \leq x \leq 2\pi$,

$$-\tan x = -\frac{1}{2},$$

showing each stage of your working.
(5 marks)

Total for question = 8 marks

Question 4

Sketch the curves C and D, where:

$$C : y = \frac{1}{2}\sin x \quad \text{and} \quad D : y = \cos(2x), \quad 0 \leq x \leq 4\pi.$$

(a) Write down the exact coordinates of the points at which C and D meet the two coordinate axes.

(3 marks)

(b) Determine the number of solutions for x in the interval $0 \leq x \leq 4\pi$ where $C = D$.

(2 marks)

(c) Determine the number of solutions for x in the interval $0 \leq x \leq 40\pi$ where $C = D$.

(3 marks)

Total for question = 8 marks