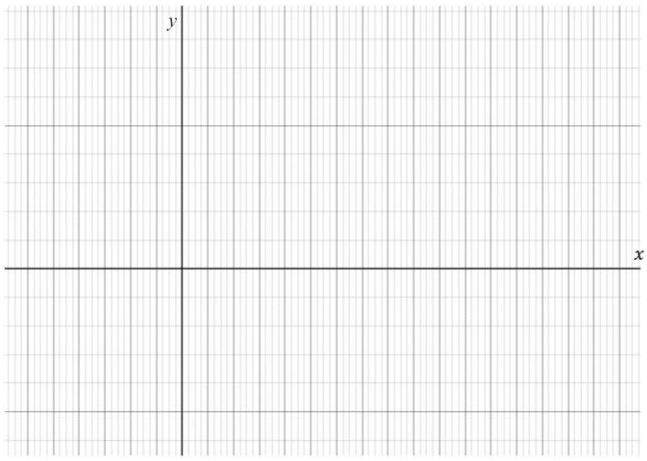
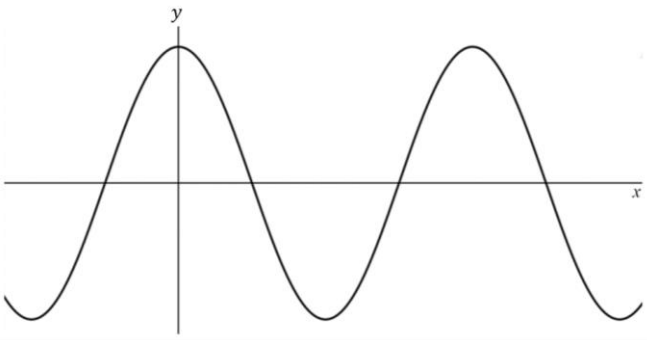
Trigonometric & Exponential Graphs Exam Practice

Q1. On the grid, draw a sketch of $y = \sin(x)$, for $-180° \leq x \leq 360°$.



(2 marks)

Q2. Below is a sketch of $y = \cos(x)$.



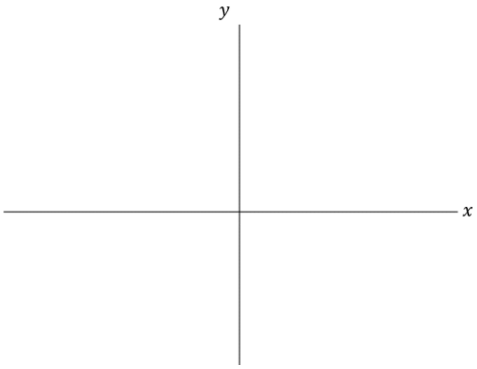
a) Label all the points where the curve crosses the x-axis and where it crosses the y-axis.

(2 marks)

b) Solve the equation $\cos(x) = -1$ in the range $-180° \leq x \leq 600°$.

(2 marks)

Q3.a) Draw the graph of $y = 2^x$ labelling any points of inter-section with the co-ordinate axes. (1 mark)

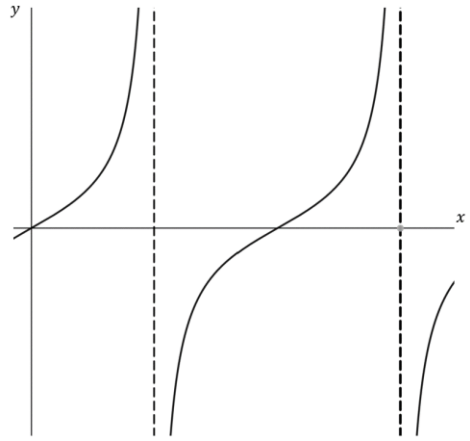


b) State whether or not the point (10, 1000) lies on the curve.

(1 mark)

c) State any solution of the equation $2^x = 3^x$ (1 mark)

Q4. Here is a graph of $y = \tan(x)$:

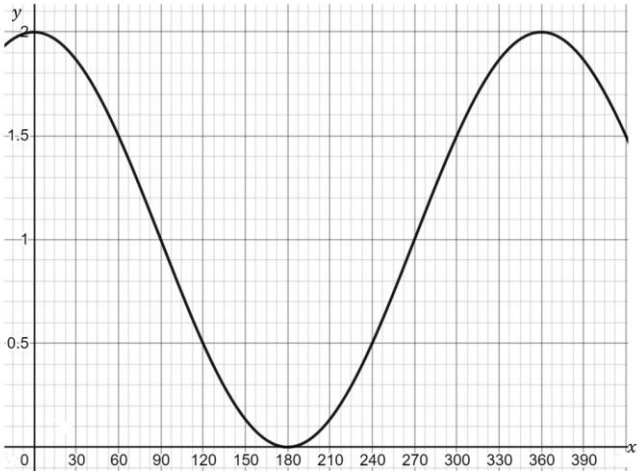


a) Label the x-intercepts [2]

b) Label the points where the vertical asymptotes meet the x-axis [2]

c) You are given that $x = 60°$ is a solution of the equation, $\tan(x) = \sqrt{3}$ State another solution of this equation in the range shown by the diagram. [1]

Q5. Below is a graph of y = cos (x) + 1



Use the graph to estimate the solution of the following equations:

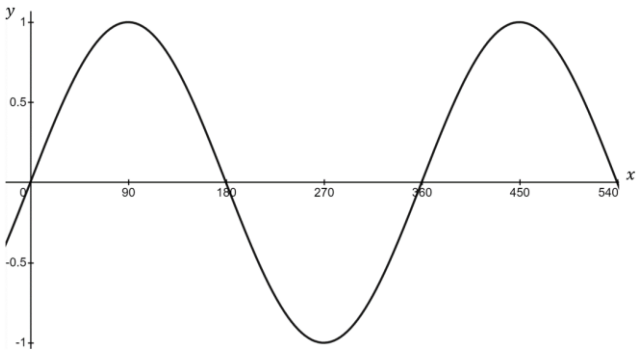
(i) cos(x) + 1 = 0.7 for $0° \leq x \leq 360°$

(1 mark)

(ii) cos(x) = 2.8, where $0° \leq x \leq 420°$

(2 marks)

Q6. Here is a sketch of y = sin (x)



a) Given that sin(30°) = 0.5, find the value of

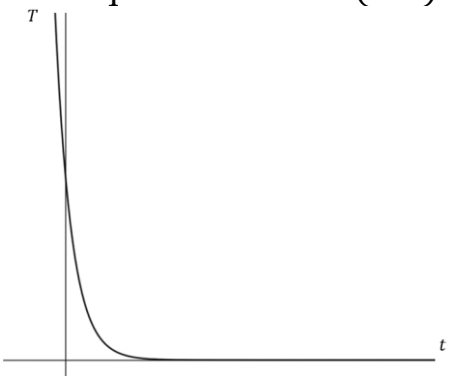
(i) sin(150°)

(ii) sin(330°)

(2 marks)

b) How many solutions does the equation $\sin(x) = \frac{x}{100}$ have in the region shown? (1 mark)

Q7. The temperature T °C of a cup of coffee left in an office t minutes after it was made is modelled by the equation $T = 60(2^{-t})$.



a) State the cup's initial temperature

(1 mark)

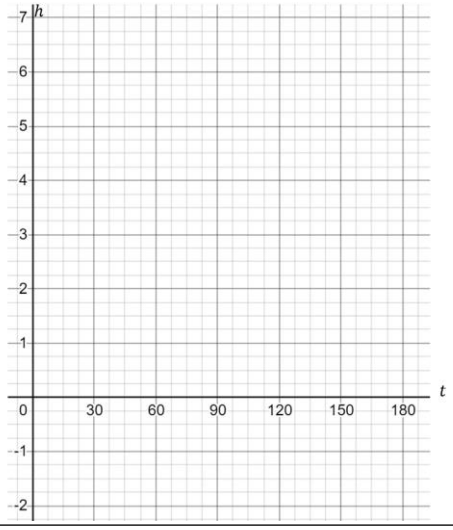
b) Find the temperature after 3 mins

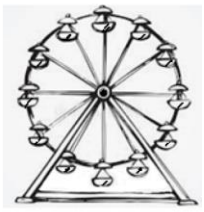
(1 mark)

c) State two criticisms of the model.

(2 marks)

Q8. The height h (metres) of a person above ground on a fairground wheel at t seconds after the ride starts is modelled by the equation, $h = 4 + 3\sin(3t)$





a) Draw the graph of h for $0 \leq t \leq 180$

b) How many secs does it take for a person to ride one complete turn of the wheel?

c) Give one advantage and disadvantage of this model over the model: $h = \sin(500t)$.