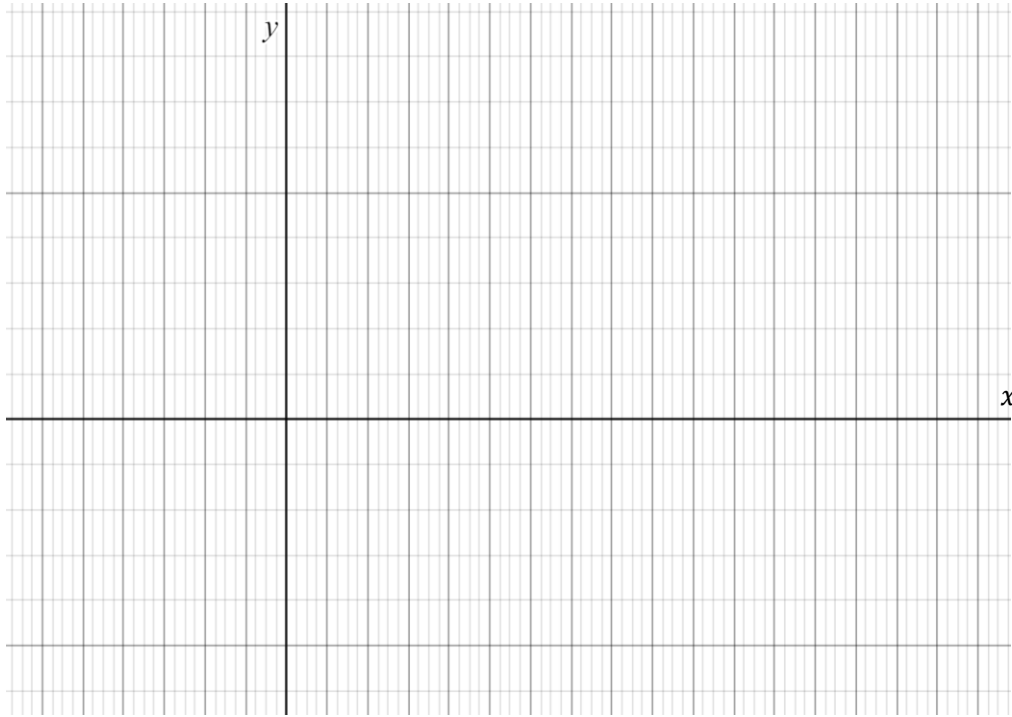


Trigonometric & Exponential Graphs Exam Practice



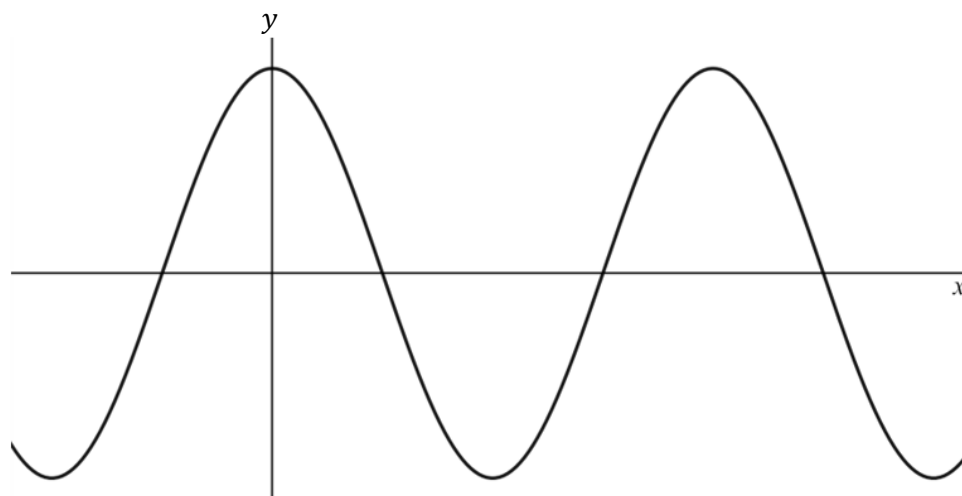
Q1. On the grid, draw a sketch of $y = \sin(x)$, for $-180^\circ \leq x \leq 360^\circ$.



(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 $-180^\circ \leq x \leq 600^\circ$.

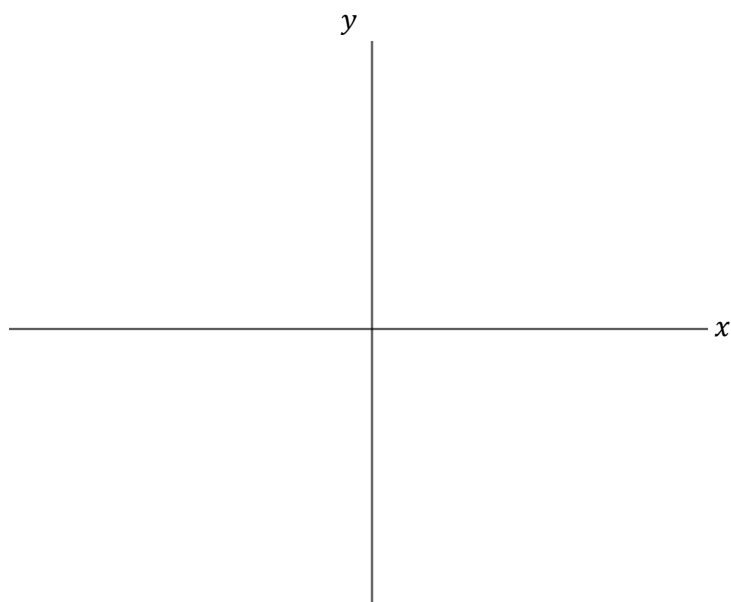
Answer: _____

(2 marks)



Q3. a) Draw the graph of $y = 2^x$ on the axes below. Label any points of intersection with the co-ordinate axes.

Answer: _____
(2 marks)



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

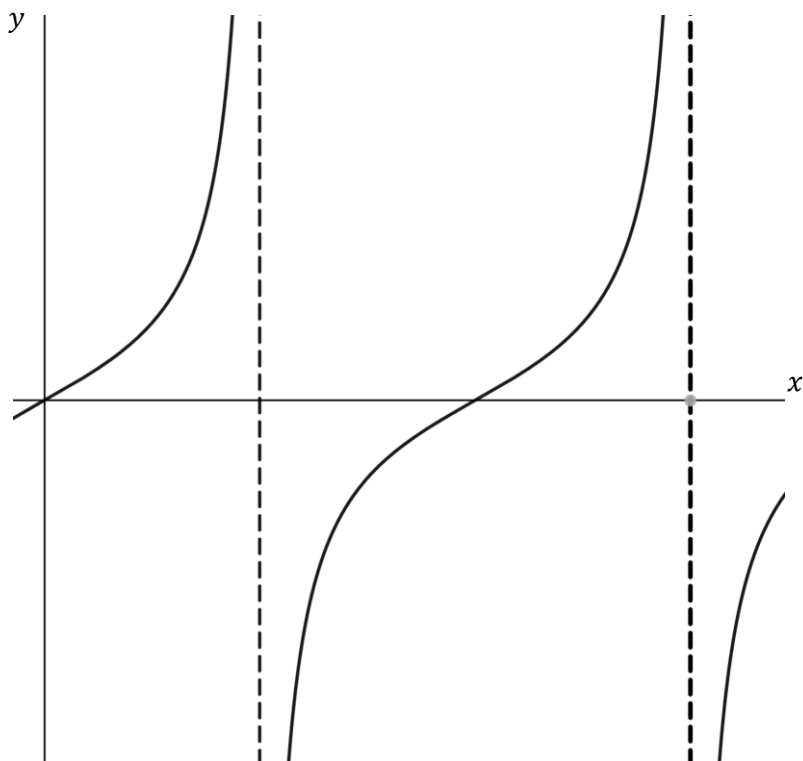
Answer: _____
(1 mark)

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

Answer: _____
(1 mark)



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

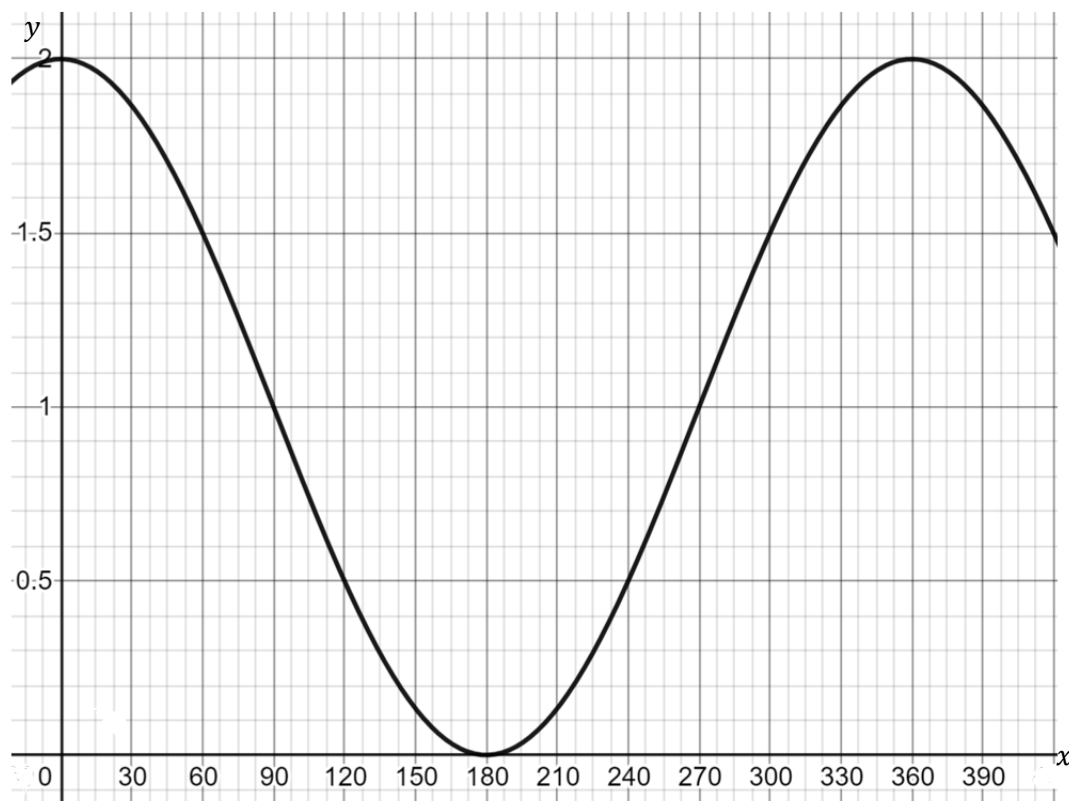


- a) Label the points where the graph meets the x-axis (2 marks)
- b) Label the co-ordinates where the vertical asymptotes meet the x-axis (2 marks)
- c) You are given that $x = 60^\circ$ is a solution of the equation, $\tan(x) = \sqrt{3}$. State another solution of this equation in the range shown by the diagram.

Answer: _____ (1 mark)



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



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

(i) $\cos(x) + 1 = 0.7$ where $0^\circ \leq x \leq 360^\circ$

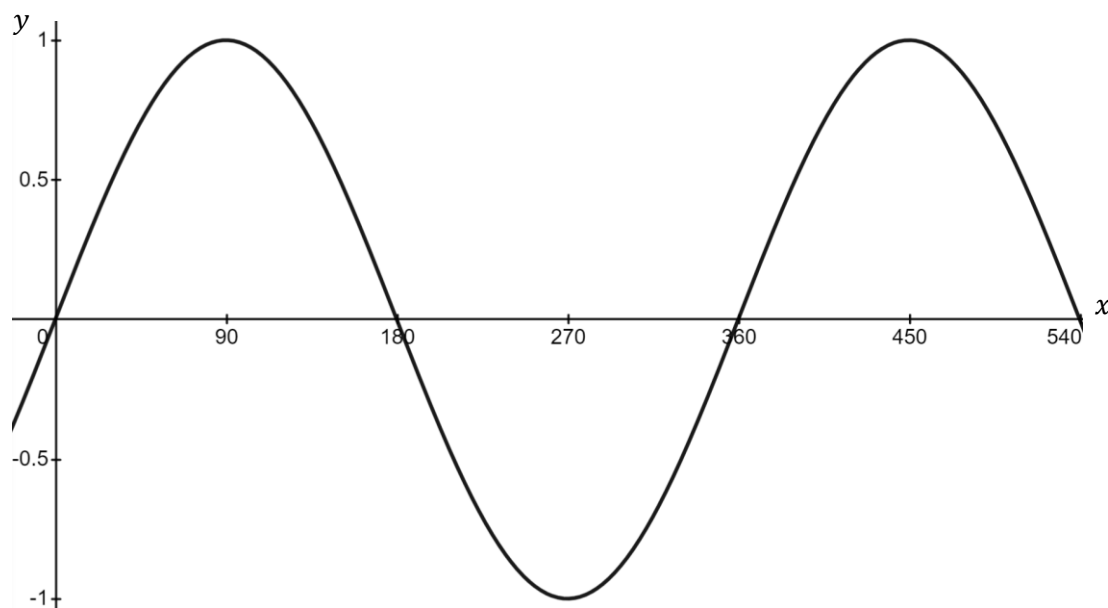
Answer: _____
(1 mark)

(ii) $\cos(x) = 2.8$ where $0^\circ \leq x \leq 420^\circ$

Answer: _____
(2 marks)



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



a) Given that $\sin(30^\circ) = 0.5$, find the value of

(i) $\sin(150^\circ)$

Answer: _____
(1 mark)

(ii) $\sin(330^\circ)$

Answer: _____
(1 mark)

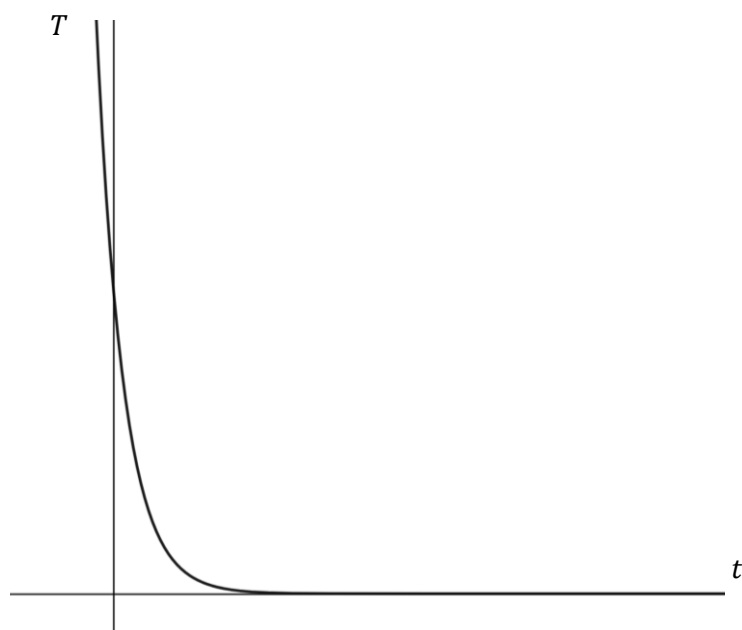
b) How many solutions does the equation $\sin(x) = \frac{x}{100}$ have in the region shown? Justify your answer.

Answer: _____
(2 marks)



Applied Mixed Problems

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 sketch of the equation is below:



a) State the initial temperature of the cup of coffee.

Answer: _____
(1 mark)

b) Work out the temperature of the coffee after 3 minutes

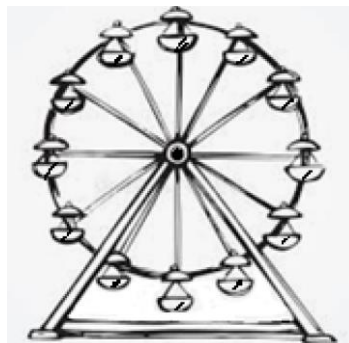
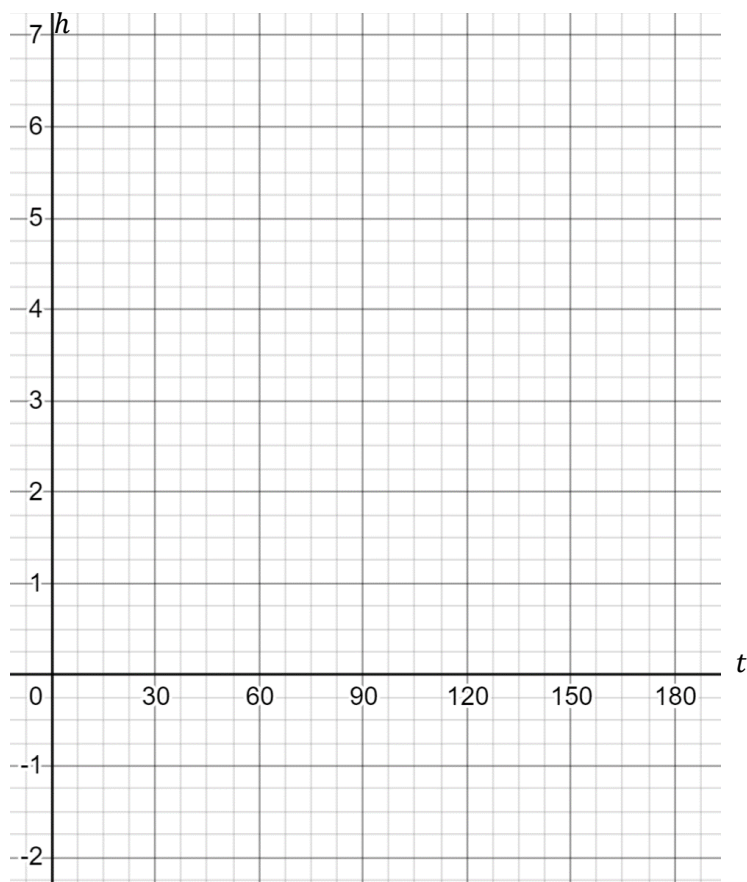
Answer: _____
(1 mark)

c) State two criticisms of the model.

Answer: _____
(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 $0^\circ \leq t \leq 180^\circ$

(2 marks)

b) Work out how many seconds it takes for the person to ride one complete turn of the wheel.

Answer: _____
(2 marks)

c) An alternative model is proposed: $h = \sin(500t)$.

State one advantage of this model compared to the first model, and one disadvantage of this model compared to the first model.

Answer: _____
(2 marks)