Name	Class

MATHS TEACHER HUB

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Types of graph

(9 – 1) Topic booklet

Higher

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

Instructions

•Use **black** ink or ball-point pen.
•**Fill in the boxes** at the top of this page with your name, centre number and candidate number.
•Answer **all** questions.
•Answer the questions in the spaces provided
– *there may be more space than you need*.
•Diagrams are NOT accurately drawn, unless otherwise indicated.
•You must **show all your working out.**
•If the question is a **1H** question you are not allowed to use a calculator.
•If the question is a **2H** or a **3H** question, you may use a calculator to help you answer.

Information

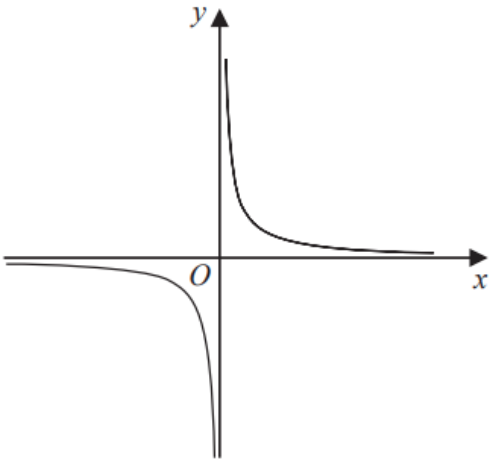
•The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question*.

Advice

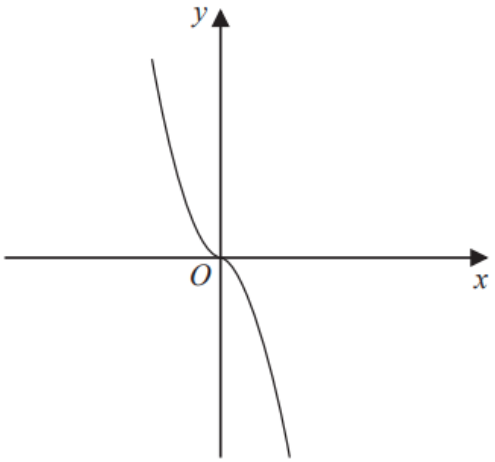
•Read each question carefully before you start to answer it.
•Keep an eye on the time.
•Try to answer every question.
•Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

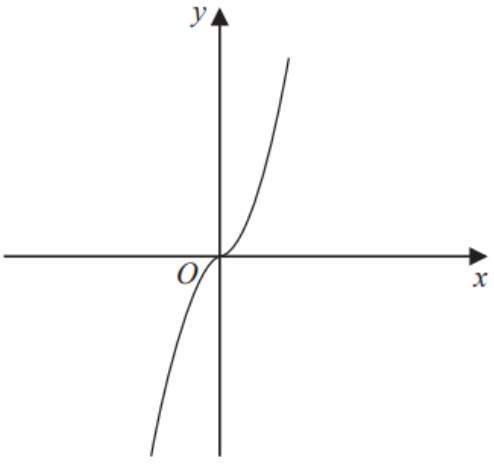
3 The diagram shows four graphs.



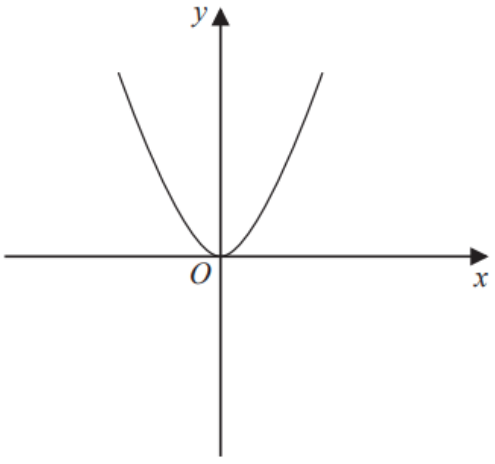
Graph **A**



Graph **B**



Graph **C**



Graph **D**

Each of the equations in the table is the equation of one of the graphs.

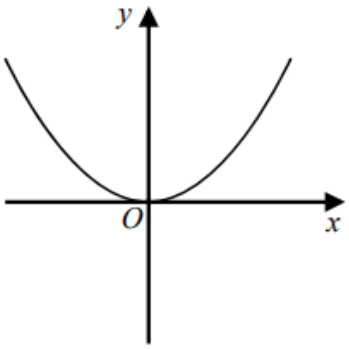
Complete the table.

Equation	Letter of graph
$y = -x^3$	
$y = x^3$	
$y = x^2$	
$y = \frac{1}{x}$	

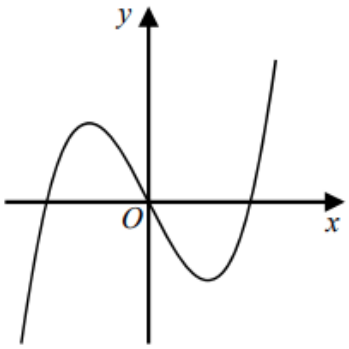
(Total for Question 3 is 2 marks)

5 Here are six graphs.

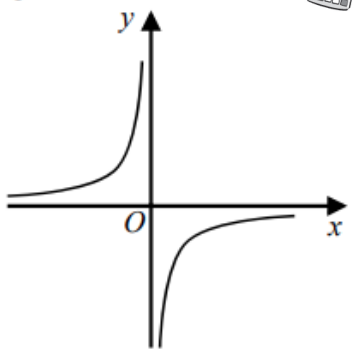
A



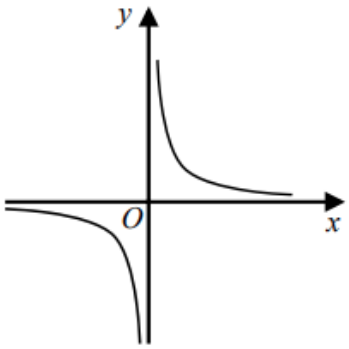
B



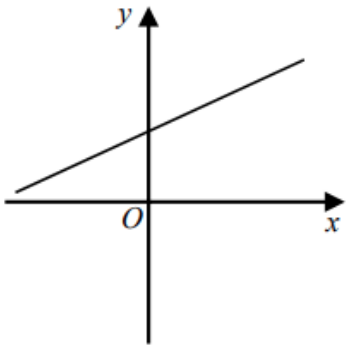
C



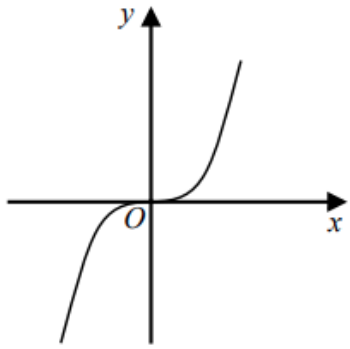
D



E



F



Write down the letter of the graph that could have the equation

(a) $y = x^3$

.....

(1)

(b) $y = \frac{1}{x}$

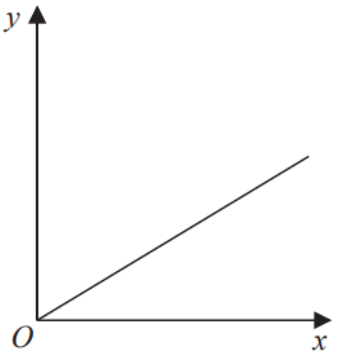
.....

(1)

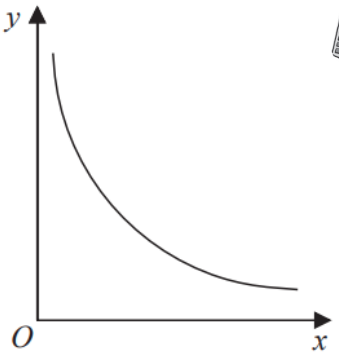
November 2019 – Paper 2H **(Total for Question 5 is 2 marks)**

11

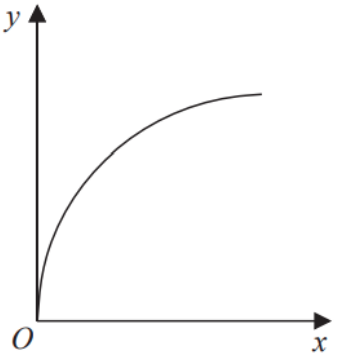
Graph **A**



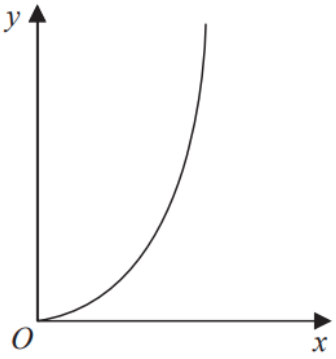
Graph **B**



Graph **C**



Graph **D**



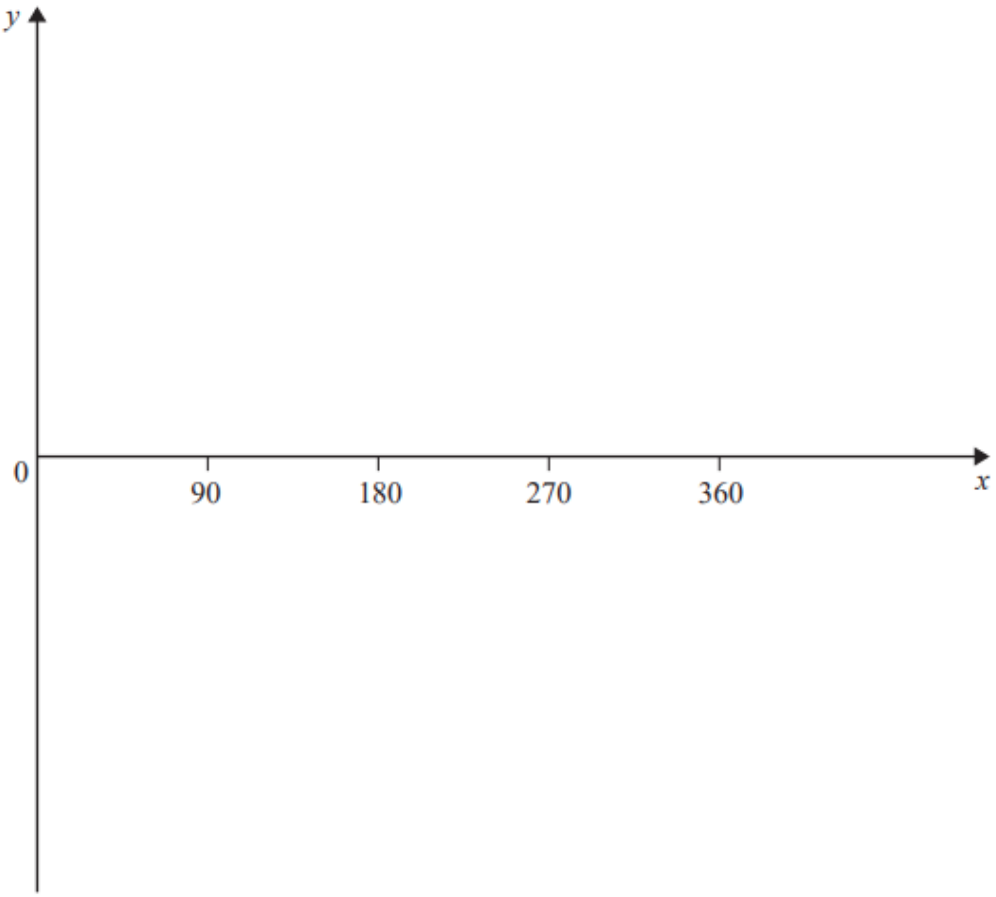
The graphs of y against x represent four different types of proportionality.

Match each type of proportionality in the table to the correct graph.

Type of proportionality	**Graph**
$y \propto x^2$	
$y \propto x$	
$y \propto \frac{1}{x}$	
$y \propto \sqrt{x}$	

(Total for Question 11 is 2 marks)

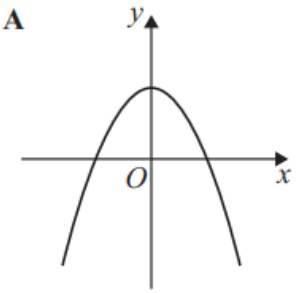
11 Sketch the graph of $y = \tan x°$ for $0 \leqslant x \leqslant 360$



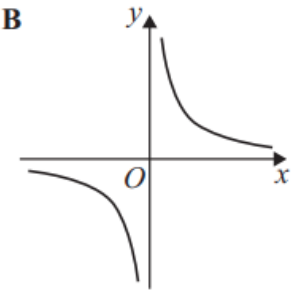
November 2018 – Paper 3H **(Total for Question 11 is 2 marks)**

12 Here are some graphs.

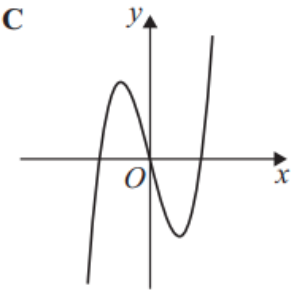
A



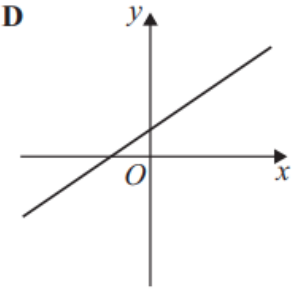
B



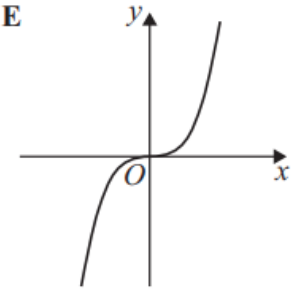
C



D



E



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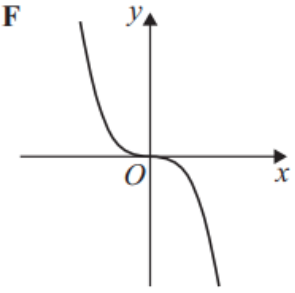
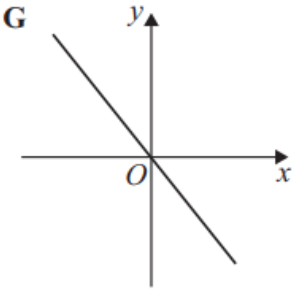
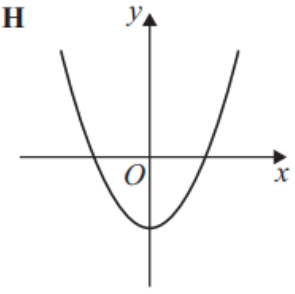


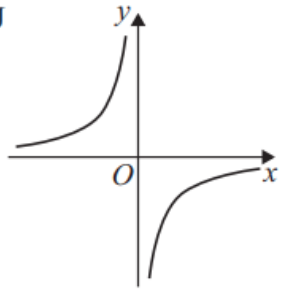
G



H



J



Write down the letter of the graph that could have the equation

(i) $y = x^2 - 4$

.....

(1)

(ii) $y = -x^3$

.....

(1)

(iii) $y = -\frac{5}{x}$

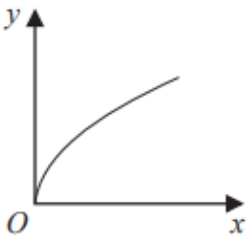
.....

(1)

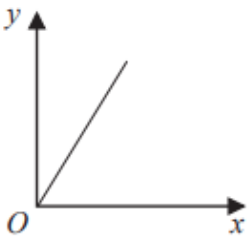
(Total for Question 12 is 3 marks)

12

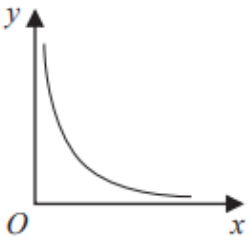
Graph A



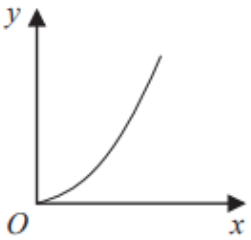
Graph B



Graph C



Graph D



The graphs of y against x represent four different types of proportionality.

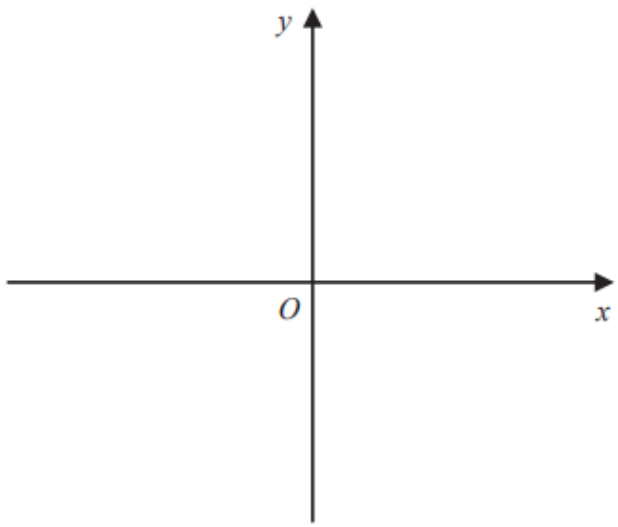
Match each type of proportionality in the table to the correct graph.

Type of proportionality	Graph letter
$y \propto x$	
$y \propto x^2$	
$y \propto \sqrt{x}$	
$y \propto \frac{1}{x}$	

June 2018 – Paper 2H

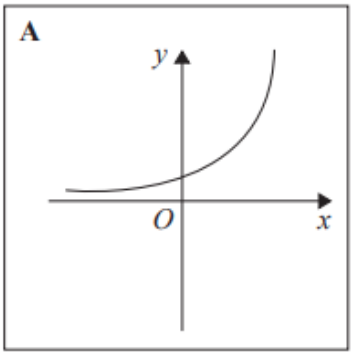
(Total for Question 12 is 2 marks)

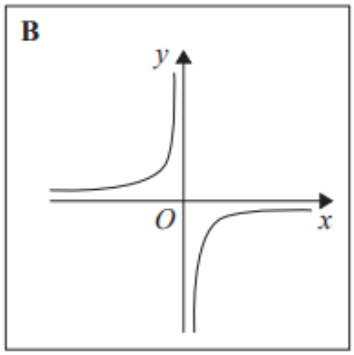
14 On the grid, sketch the curve with equation $y = 2^x$
Give the coordinates of any points of intersection with the axes.

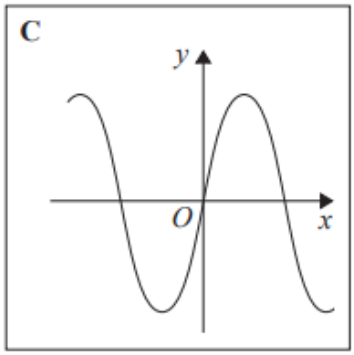


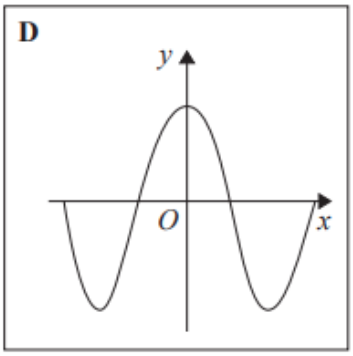
November 2018 – Paper 2H **(Total for Question 14 is 2 marks)**

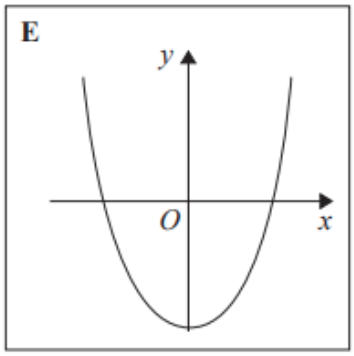
14 Here are some graphs.

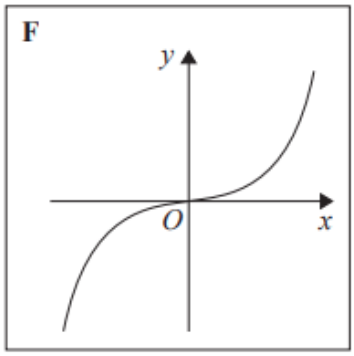


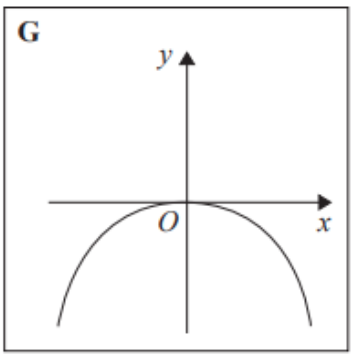


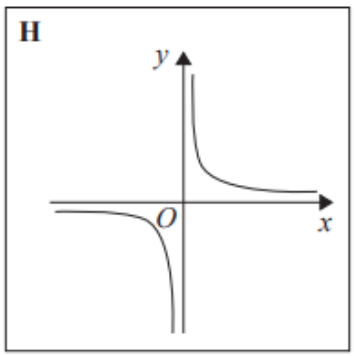


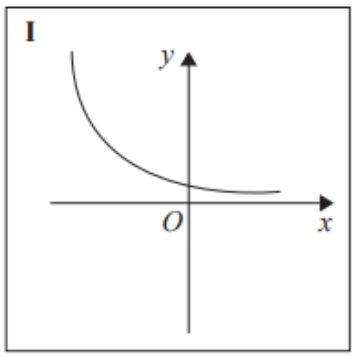










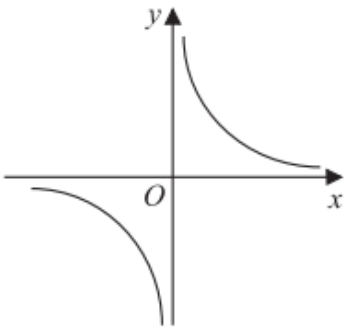


In the table below, match each equation with the letter of its graph.

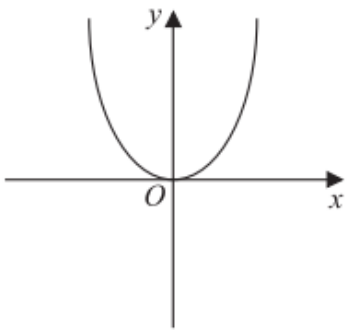
Equation	Graph
$y = \sin x$	
$y = x^3 + 4x$	
$y = 2^x$	
$y = \frac{4}{x}$	

(Total for Question 14 is 3 marks)

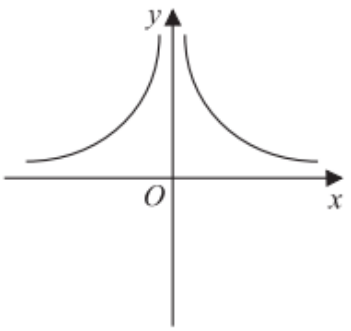
16 These graphs show four different proportionality relationships between y and x.



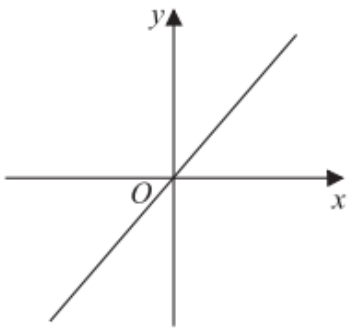
Graph A



Graph B



Graph C



Graph D

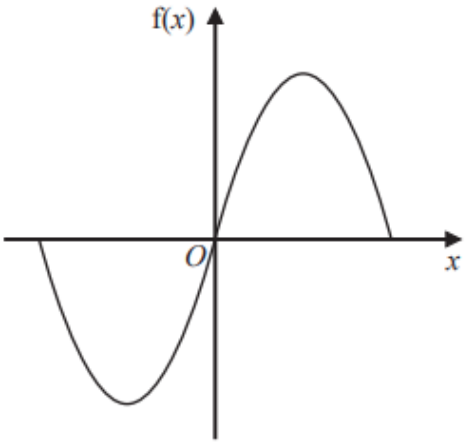
Match each graph with a statement in the table below.

Proportionality relationship	**Graph letter**
y is directly proportional to x	
y is inversely proportional to x	
y is proportional to the square of x	
y is inversely proportional to the square of x	

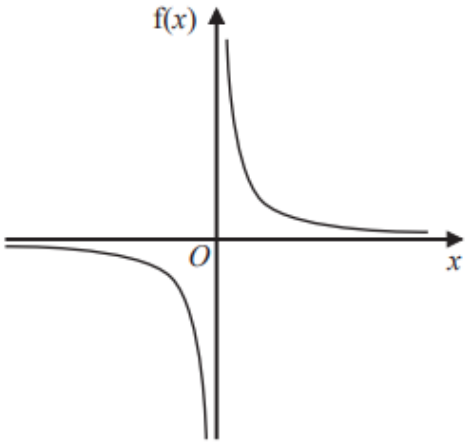
(Total for Question 16 is 2 marks)

17 Here are four graphs.

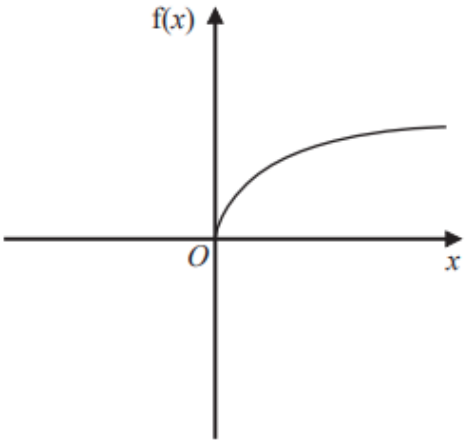
Graph A



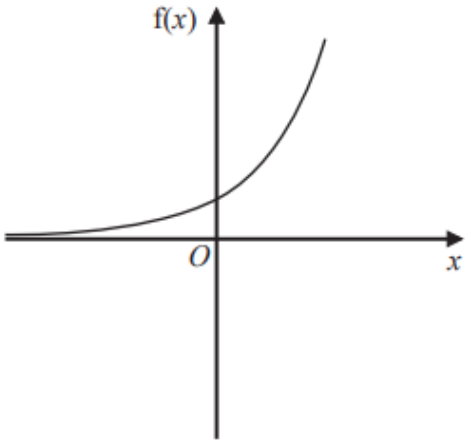
Graph B



Graph C



Graph D



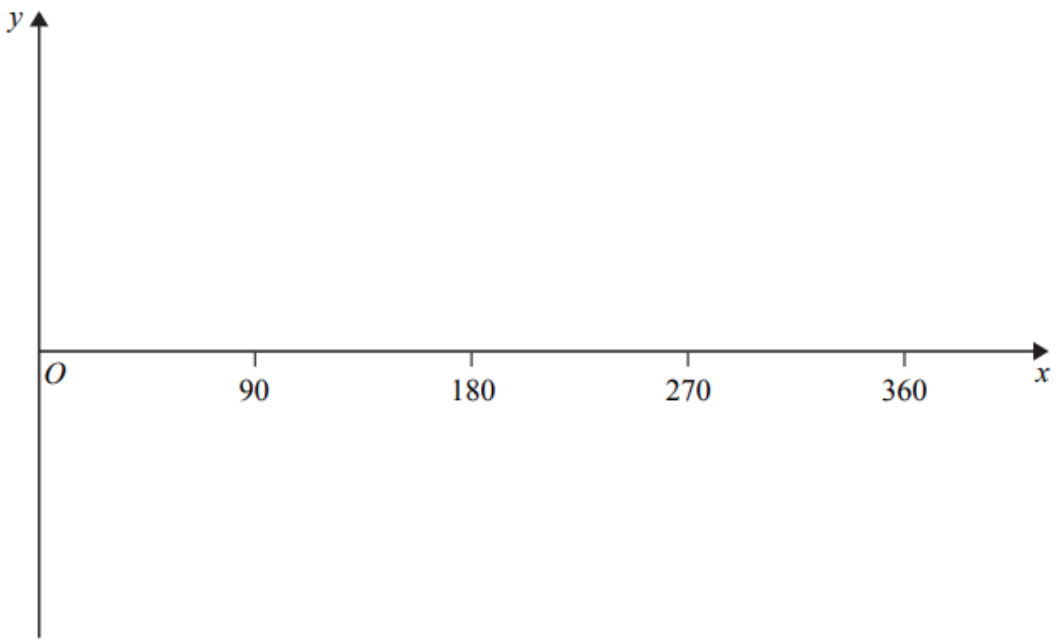
The graphs represent four different types of function f.

Match each description of the function in the table to the letter of its graph.

Description of function	**Graph**
f(x) is inversely proportional to x	
f(x) is a trigonometrical function	
f(x) is an exponential function	
f(x) is directly proportional to $\sqrt{x}$	

(Total for Question 17 is 2 marks)

19 Sketch the graph of $y = \cos x°$ for $0 \leqslant x \leqslant 360$

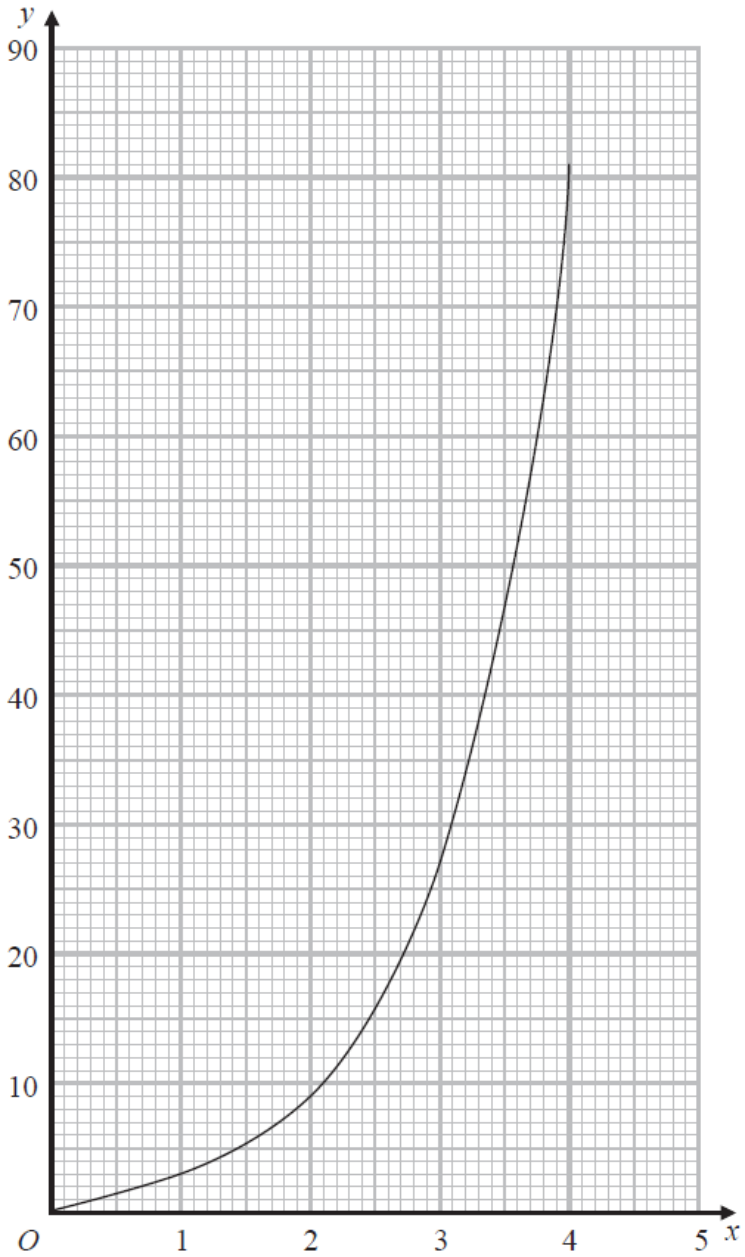


(2)

(Total for Question 19 is 2 marks)

19 Sana needs to draw the graph of $y = 3^x$ for $0 \leqslant x \leqslant 4$

She draws the graph shown on the grid.



Write down one thing Sana has done wrong.

.....

.....

.....

(Total for Question 19 is 1 mark)

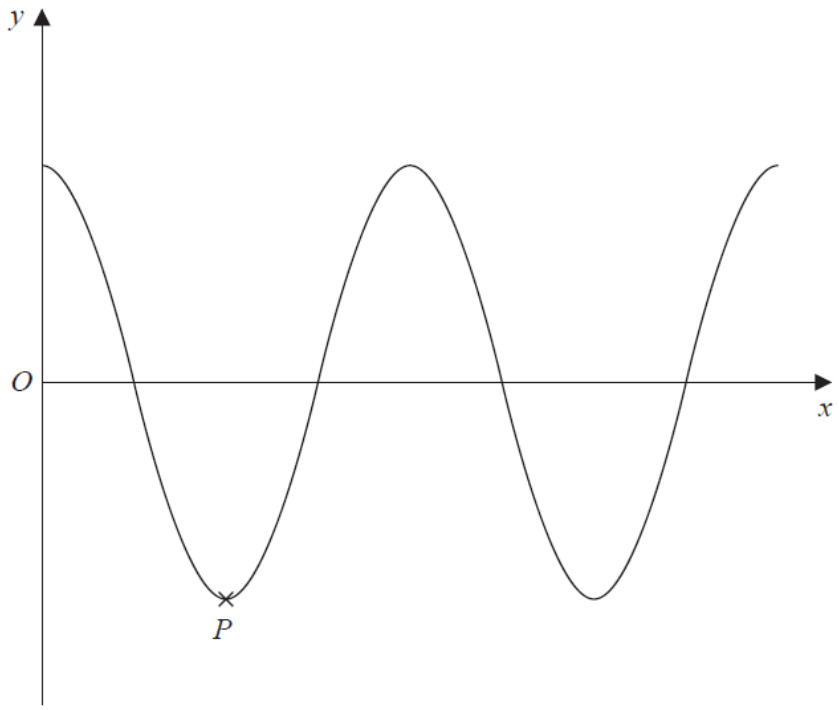
20 The equation of a curve is $y = a^x$
A is the point where the curve intersects the y-axis.

State the coordinates of A.

(..... , ...)
(1)

June 2017 – Paper 3H **(Total for Question 20 is 1 mark)**

21



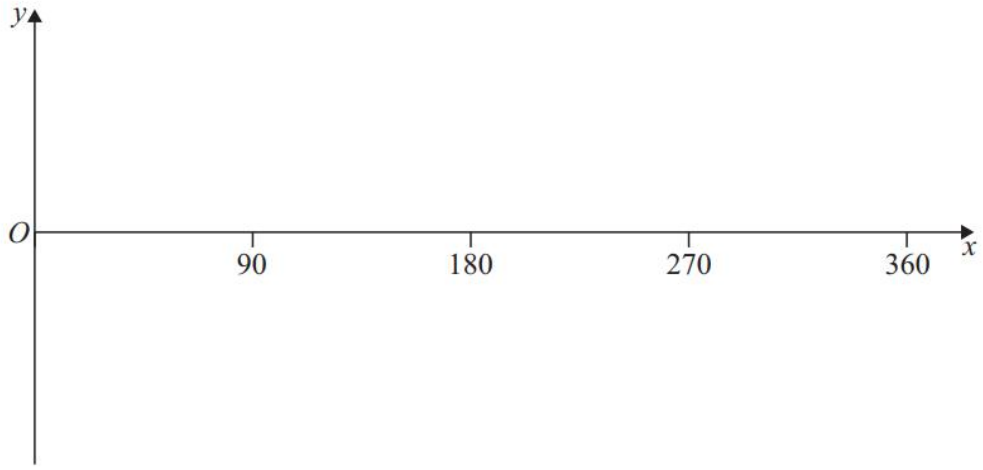
The diagram shows a sketch of part of the curve with equation $y = \cos x°$
P is a minimum point on the curve.

Write down the coordinates of P.

(..... , ...)

November 2022 – Paper 1H **(Total for Question 21 is 2 marks)**

22 (a) Sketch the graph of $y = \sin x°$ for $0 \leqslant x \leqslant 360$



(2)

(b) Solve the equation $2\sin x° = -1$ for $0 \leqslant x \leqslant 360$

.....

(2)

(Total for Question 22 is 4 marks)