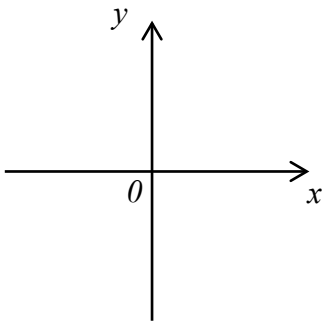
Topic test

Further sketching graphs (Higher)

Section A. Calculator.

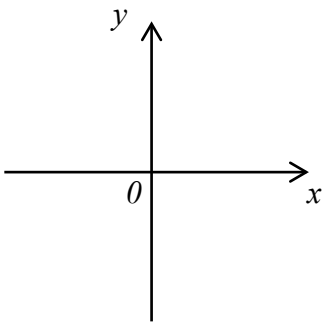
1(a) On the axes sketch the graph of $y = \frac{1}{x}$

[1 mark]



1 (b) On the axes sketch the graph of $y = x^3 + 3$

[1 mark]



2 The graphs $y = x^2$ and $y = x^3$ intersect in two places.

Circle the pair of points at which the graphs intersect.

[1 mark]

(0, 0), (2, 4) (0, 0), (1, 1) (0, 0), (2, 8) (0, 0), (1, 2)

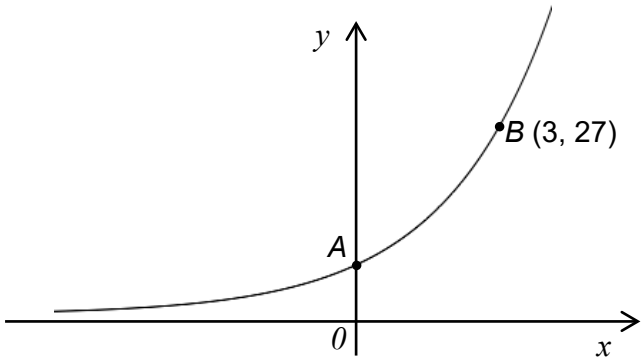
3 The graphs $y = \frac{1}{x}$ and $y = x^3$ intersect in two places.

Circle the pair of points at which the graphs intersect.

[1 mark]

(0, 0), (1, 1) (1, 0), (0, 1) (1, 1), (–1, 1) (1, 1), (–1, –1)

4 This is the graph of $y = k^x$



4 (a) Write down the coordinates of the point *A*.

[1 mark]

Answer (_____),(_____)

4 (b) The graph passes through *B* (3, 27).

Work out the value of k.

[1 mark]

Answer _____

5 This equation models the height of the tide in a harbour.

$$H = 4.8 \times \sin(30t) + 5.1$$

Where H is the height of the tide, in metres, and t is the time, in hours, after midnight.

5 (a) Explain how you can tell that high tide is at 3 am

[1 mark]

5 (b) Once the height of the tide is 2.7 metres or lower, the harbour cannot be used.

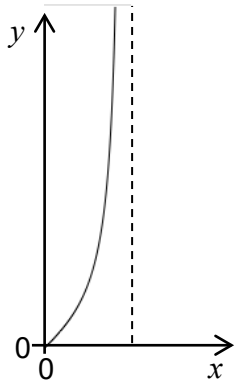
Work out the first time after midnight this will occur.

[4 marks]

Answer _____

Section B. Non-calculator.

6 This is part of the graph of $y = \tan x$

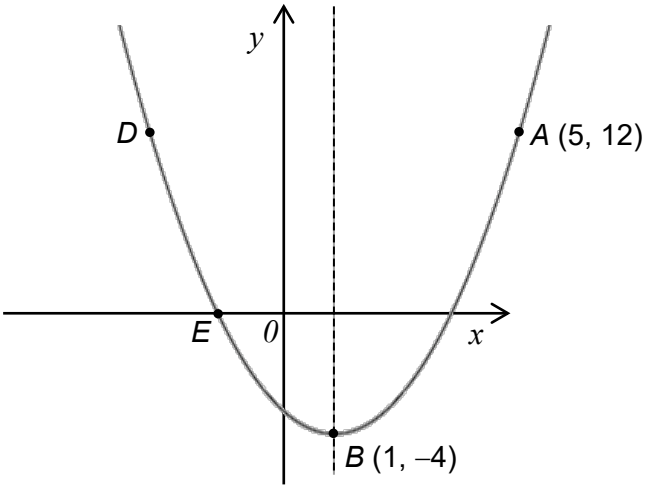


Circle the equation of the dashed line.

[1 mark]

$x = 90$ $x = 180$ $x = 270$ $x = 360$

7 The quadratic graph shown is symmetrical about the line $x = 1$



7 (a) *D* is the reflection of *A* in the line of symmetry.

Write down the coordinates of *D*.

[1 mark]

Answer (_____),(_____)

7 (b) *E* is the point (–1, 0).

Work out the equation of the curve.

Give your answer in the form $y = x^2 + bx + c$

[3 marks]

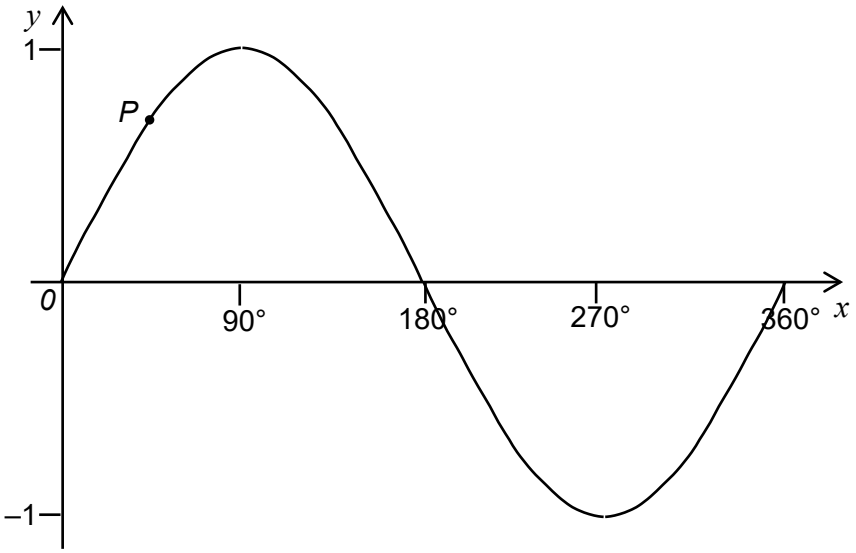
_____

_____

_____

Answer _____

8 Here is the graph of $y = \sin x$



The point *P* has coordinates (50, 0.766), where the y-coordinate is given to 3 dp.
One other point has a y-coordinate of 0.766
Two other points have a y-coordinate of –0.766

Use the symmetry of the graph to complete the coordinates of the 3 points.

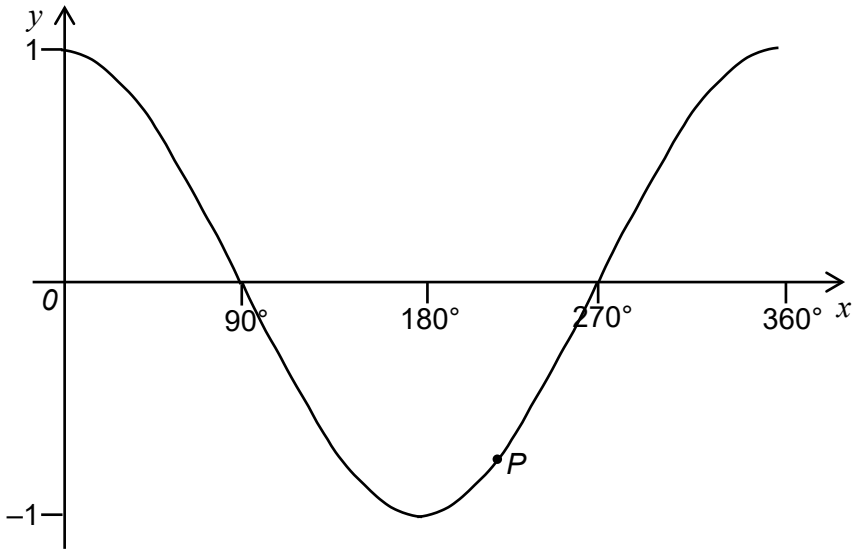
[2 marks]

Answer (_____),(0.766)

Answer (_____),(–0.766)

Answer (_____),(–0.766)

9 Here is the graph of $y = \cos x$



The point *P* has coordinates (205, –0.9), where the y-coordinate is given to 1 dp.
One other point has a y coordinate of –0.9
Two other points have a y coordinate of +0.9

Use the symmetry of the graph to complete the coordinates of the 3 points.

[2 marks]

Answer (_____ , 0.9)

Answer (_____ , 0.9)

Answer (_____ , –0.9)