



Name: _____ **Date:** _____ **Score:** _____ / 55

- 1** The point $(2, 5)$ lies on the graph of $y = f(x)$.

Write down the coordinates of the image of this point on each of these graphs.

- a. $y = f(x + 3)$
- b. $y = f(x) - 4$
- c. $y = -f(x)$
- d. $y = f(-x)$

(4 marks)

Answer _____

- 2** The point $(6, -4)$ lies on the graph of $y = f(x)$.

Write down the coordinates of the image of this point on each of these graphs.

- a. $y = 2f(x)$
- b. $y = f(2x)$
- c. $y = f\left(\frac{1}{3}x\right)$
- d. $y = -3f(x)$

(4 marks)

Answer _____

3 The point A(-2, 3) lies on the graph of $y = f(x)$.

Write down the coordinates of the image of A on each of these graphs.

a. $y = f(x - 3) + 1$

b. $y = -f(x + 1)$

c. $y = 2f(x) - 1$

d. $y = f(2x) + 5$

(4 marks)

Answer _____

4 The graph of $y = f(x)$ has a turning point at (3, -5).

a. Write down the coordinates of the turning point of the graph of $y = f(x) + 4$

b. Write down the coordinates of the turning point of the graph of $y = f(x - 2)$

(2 marks)

Answer _____

5 The point A (4, 7) lies on the graph of $y = f(x)$.

a. Find the coordinates of the image of A on the graph of $y = f(-x)$

b. Find the coordinates of the image of A on the graph of $y = -f(x)$

(2 marks)

Answer _____

6 The graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$ has a maximum point at (90, 1).

a. Write down the coordinates of the maximum point of the graph of $y = \sin x - 3$

b. Write down the coordinates of the maximum point of the graph of $y = \sin (x - 30^\circ)$

(2 marks)

Answer _____

7 The graph of $y = f(x)$ passes through the point $(2, 5)$.

- Write down the coordinates of a point that must lie on the graph of $y = f(x + 6)$
- Write down the coordinates of a point that must lie on the graph of $y = f(x) - 2$

(2 marks)

Answer _____

8

- Describe fully the single transformation that maps the graph of $y = x^2$ onto the graph of $y = (x + 4)^2$
- Describe fully the single transformation that maps the graph of $y = x^2$ onto the graph of $y = -x^2$

(2 marks)

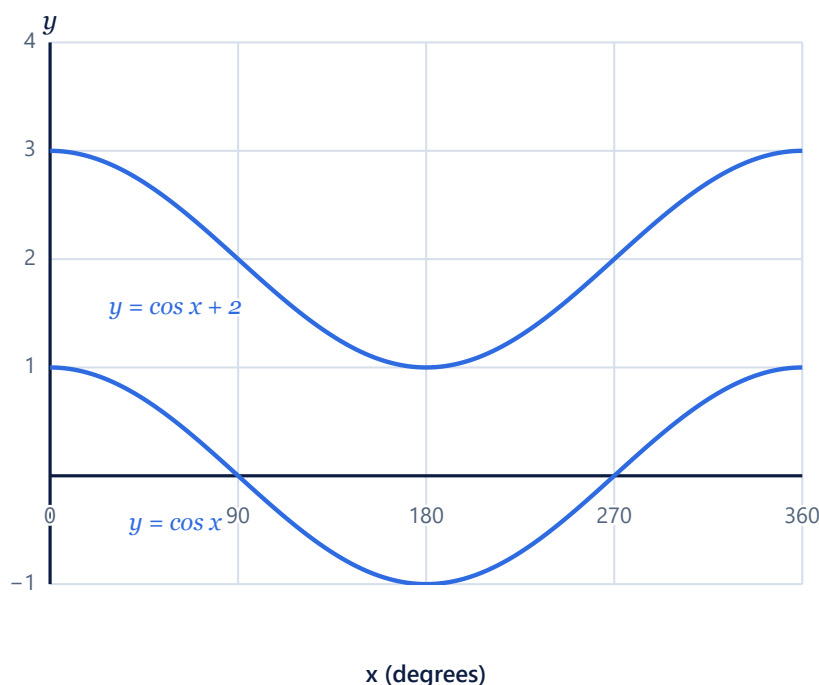
Answer _____

9

The graph of $y = \cos x$ is drawn for $0^\circ \leq x \leq 360^\circ$.

The graph of $y = \cos x + 2$ is sketched on the same axes for $0^\circ \leq x \leq 360^\circ$.

- Write down the coordinates of the minimum point of $y = \cos x + 2$
- Write down the coordinates of the maximum point of $y = \cos x + 2$ with the smallest x -coordinate



(2 marks)

Answer _____

10 The curve C has equation $y = f(x)$ where $f(x) = x^2 + 2x$.

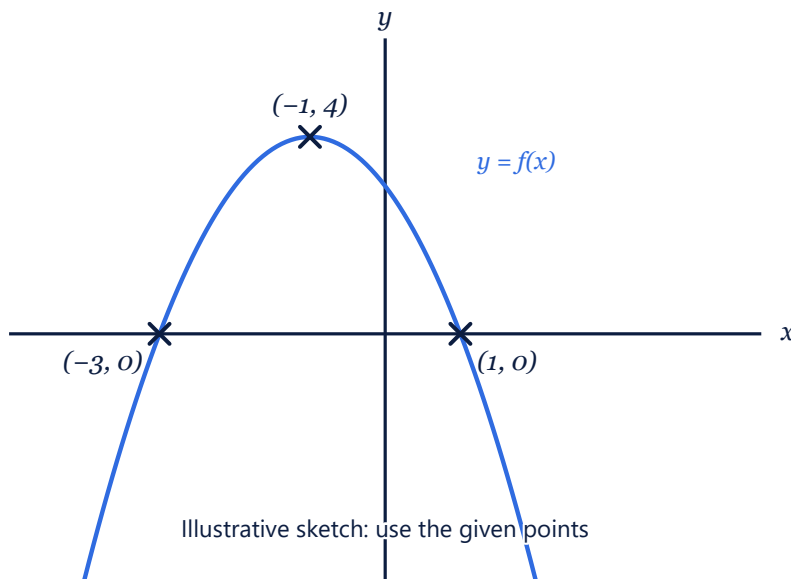
- Curve A is the reflection of C in the y -axis. Find the equation of curve A in the form $y = x^2 + bx + c$
- Curve B is the translation of C by 3 units in the positive y direction. Find the equation of curve B.

(3 marks)

Answer _____

11 The graph of $y = f(x)$ has a maximum point at $(-1, 4)$ and crosses the x -axis at $(-3, 0)$ and $(1, 0)$.

- Write down the coordinates of the minimum point of the graph of $y = -f(x)$
- Write down the coordinates of the maximum point of the graph of $y = f(x - 2)$
- Write down the coordinates of the points where the graph of $y = f(x - 2)$ crosses the x -axis.



(3 marks)

Answer _____

12 $f(x) = x^2 - 4x + 7$

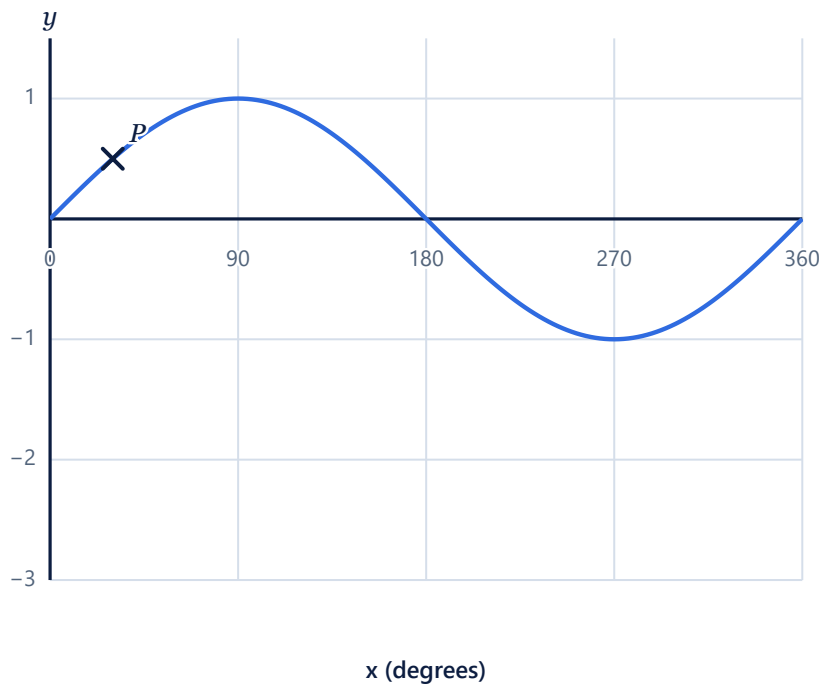
- Write $f(x)$ in the form $(x - a)^2 + b$ and hence write down the coordinates of the turning point of $y = f(x)$
- Write down the coordinates of the turning point of $y = f(x - 3)$
- Find the equation of $y = f(-x)$, giving your answer in the form $y = x^2 + bx + c$

(4 marks)

Answer _____

13 The diagram shows the graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$.

- On the same axes, sketch the graph of $y = \sin x - 2$ for $0^\circ \leq x \leq 360^\circ$
- The point $P(30, 0.5)$ lies on the graph of $y = \sin x$. P is mapped to the point Q on the graph of $y = \sin(x - 60^\circ)$. Find the coordinates of Q .



(4 marks)

Answer _____

14 $f(x) = \cos x^\circ$ for all real values of x

- Write down the coordinates of the minimum point of the graph of $y = f(x) + 2$
- Write down the coordinates of the maximum point of the graph of $y = f(x - 30)$ for $0 \leq x \leq 360$
- The graph of $y = f(x)$ is reflected in the x -axis. Write down the equation of the reflected graph.

(4 marks)

Answer _____

15 Describe fully the single transformation that maps the graph of $y = f(x)$ onto the graph of

- $y = f(x) + 5$
- $y = f(x - 4)$
- $y = -f(x)$
- $y = f(2x)$
- $y = 3f(x)$

(5 marks)

Answer _____

16 The graph of $y = \tan x^\circ$ passes through $(45, 1)$ and has an asymptote at $x = 90$.

The graph of $y = \tan x^\circ$ is reflected in the x -axis and then translated 30 to the right and 2 up. This gives the graph C with equation $y = -\tan(x - 30)^\circ + 2$.

- Write down the coordinates of the image of $(45, 1)$ on C.
- Write down the equation of the image of the asymptote $x = 90$ on C.
- Write down the y -coordinate of the point on C where $x = 30$.

(4 marks)

Answer _____

17 $f(x) = x^2 - 4x$

- Write $f(x + 1)$ in the form $x^2 + ax + b$.
- The graph of $y = f(x)$ has its minimum point at $(2, -4)$. Write down the minimum point of $y = f(x + 1)$.

(4 marks)

Answer

End of questions | Total 55 marks