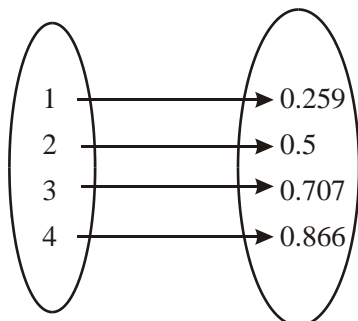


Answers to Trig Functions Review Packet

1. (a) $f: x \mapsto 3x - 2$ (A1)
 $x \in \{-1, 0, 1, 2, 3\}$ (A1)

(b)



(A2)

Note: Award (A1) for the correct domain, (A1) for the correct range.

[4]

2. (a) $c = 1$ (A1) (C1)

- (b) amplitude = $\frac{4+2}{2}$ (M1)
 $= 3$ (A1)

The graph of $y = \sin x^\circ$ has been reflected in a line parallel to the x -axis therefore $a = -3$

(A1) (C3)

[4]

3. (a) (i) Domain: \mathbb{R} (A2)

- (ii) Range: $\{y \mid y \geq 2\}$ accept $y \geq 2$ (A2) (C4)

- (b) (i) Domain: $\{x \mid -360^\circ \leq x \leq 360^\circ\}$ (A2)

Accept $-360 \leq x \leq 360$

- (ii) Range: $\{y \mid -1.5 \leq y \leq 1.5\}$ (A2) (C4)

Accept $-1.5 \leq y \leq 1.5$

[8]

4. (a) $p = 4 + 1 = 5$ cm (M1) (A1) 2

- (b) (i) $\frac{360^\circ}{60} \times 10 = 60^\circ$ (M1) (A1)

OR

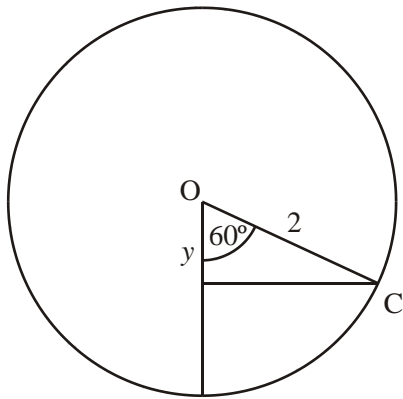
60° (A2)

- (ii) $\cos 60^\circ = \frac{x}{2}$ (M1)

$\Rightarrow x = 2 \cos 60^\circ = 1$ (A1)

- (iii) $q = 1 + 2 + 1 = 4$ cm (A1) 5

(c)



$$\cos 60^\circ = \frac{y}{2}$$

(M1)

$$\Rightarrow y = 2 \cos 60^\circ = 1$$

(A1)

$$\text{Therefore, } 2 - 1 = 1$$

(A1)

$$\text{so, } r = 1 + 1 = 2 \text{ cm.}$$

(A1)

4

(d) $\frac{(\text{Maximum value} - \text{minimum value})}{2}$

$$= \frac{(5-1)}{2} = 2$$

(M1)

$$\text{Therefore, } c = 1 + 2 = 3$$

(A1)

$$k = \text{amplitude} = 5 - 3 = 2$$

(M1) (A1)

4

[15]

5. (a) (i) 120°

(A2) (C2)

(ii) 1

(A2) (C2)

(iii) 1

(A2) (C2)

(b) $\frac{360}{a} = 120 \Rightarrow a = 3$

(A2) (C2)

[8]

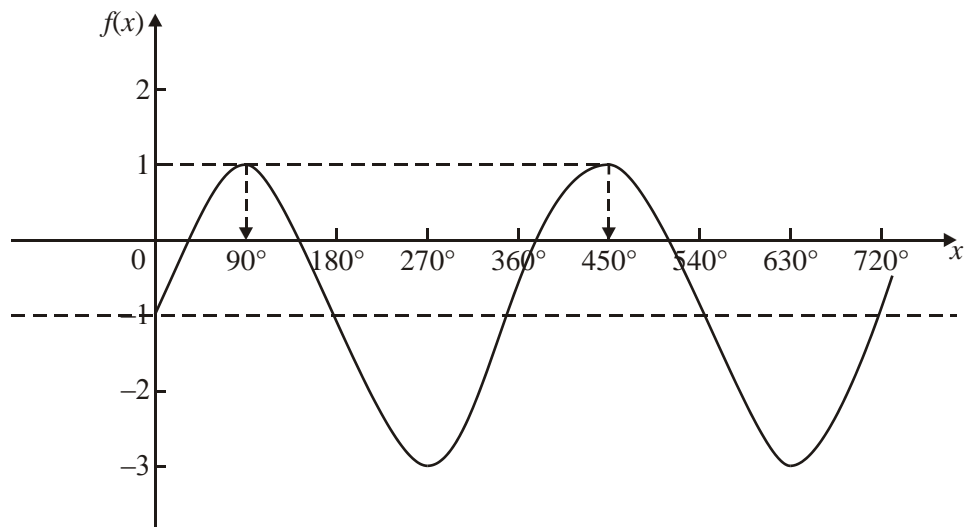
6. (a) 360°

(A1) (C1)

(b) $-2 - 1 = -3$

(M1)(A1)(A1) (C3)

(c)



$x = 90^\circ, x = 450^\circ$

(G2)(G2)(C2)(C2)

OR

$2 \sin x - 1 = 1$

(M1)

$2 \sin x = 2$

(A1)

$\sin x = 1$

(A1)(A1)(C2)(C2)

$x = 90^\circ, 450^\circ$

Notes: Award (C2) for $x = 90^\circ$ with no working shown.

Answers given in radians

Award (A0) for (a) 2π .

Award (M1)(A1)(A1)(A1)ft for (c) $\frac{\pi}{2}, \frac{5\pi}{2}$.

[8]

7. $a = 5$
 $b = 2$
 $c = 3$

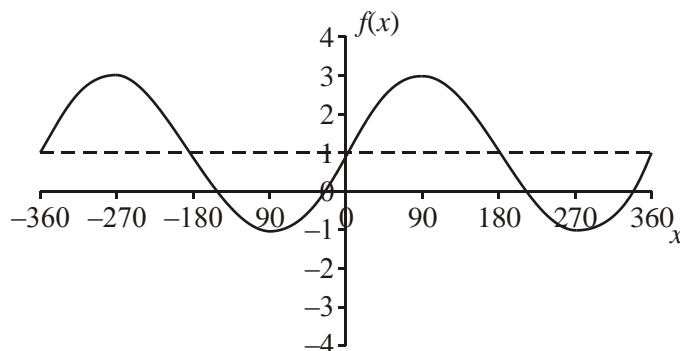
(A2)

(A2)

(A2)

[6]

8. (a)



x -axis from -360° to 360°

(A1)

2 maxima at $y = 3$

(A1)

2 minima at $y = -1$

(A1)

Correct shape of graph with reasonable axes intercepts.

(A1)

4

(b) Range $-1 \leq y \leq 3$ or $[-1, 3]$

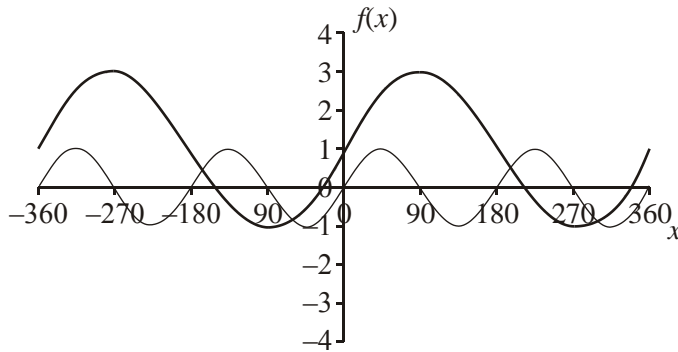
(A2)

2

Note: Award (A1) for -1 to 3 .

(c) Amplitude = 2 (A1) 1

(d)



Correct maximum (A1)
 Correct minimum (A1)
 Correct period (A1)
 Correct shape with reasonable axes intercepts. (A1) 4

(e) Period 180° (A1) 1

(f) 4 solutions (A1) 1

(g) $x = 195^\circ$ (G2)
 $x = 296^\circ$ (G2) 4

Note: If more than two solutions given award (A2).

[17]

9. (a) 2 (A1) (C1)

(b) 18 (A1) (C1)

(c) $6 \leq t \leq 12$ (A1)(A1) (C2)

Notes: Award (A1) for both numbers correct, (A1) for inequality signs.

Award (A1) for "from 6 to 12".

(d) $360 / b = 24$ (M1)

$b = 15$ (A1)

OR

Substituting into the equation of the function the coordinates of any point on the graph (M1)

$b = 15$ (A1) (C2)

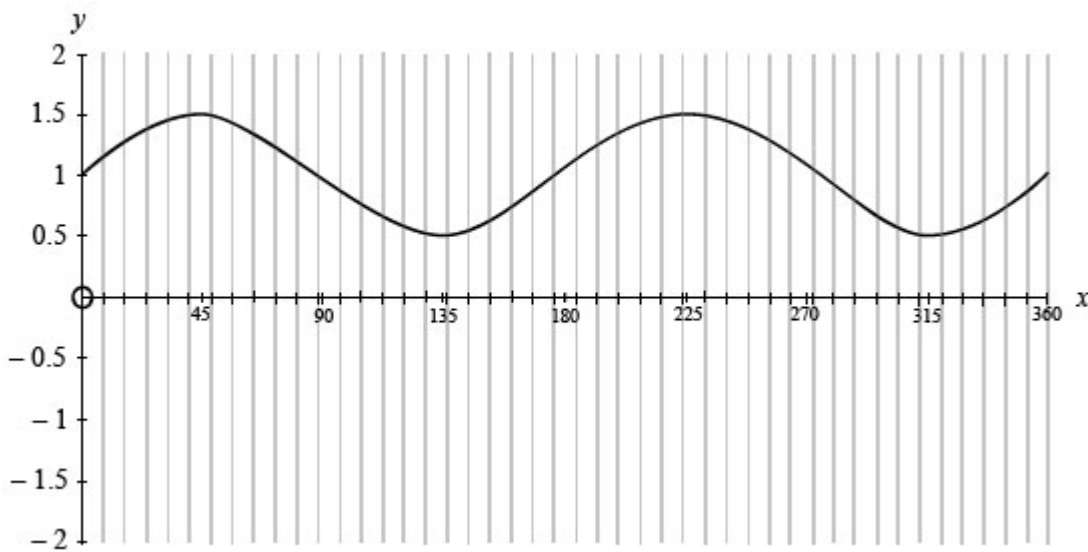
[6]

10. (a) (i) 120° (A2)
(ii) 4 (A2) (C4)
- (b) correct line on graph (A2) (C2)
- (c) $10^\circ (\pm 3^\circ)$ (A1)
 $50^\circ (\pm 3^\circ)$ (A1) (C2)

Note: Answers by calculation are 10° and 50° exactly.

[8]

11. (a)



(A4)(C4)

*Notes: (A1) for correct y-intercept
(A1) for correct minimum points
(A1) for correct maximum points
(A1) for smooth sine curve.*

- (b) period = 180° (A1)(ft) (C1)
- (c) amplitude = $\frac{1}{2}$ (A1)(ft) (C1)

[6]