Worksheet/Sine and Cosine functions

Question (1)

Find the amplitude and period of the following functions.

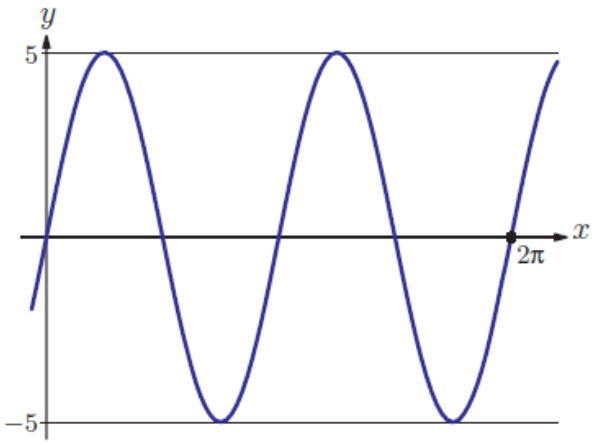
(a) $f(x) = 3\sin 4x$, where x is in degrees

(c) $f(x) = \cos 3x$, where x is in degrees

(d) $f(x) = 2\sin \pi x$, where x is in radians

Question (2)

The graph has equation $y = p\sin(qx)$ for $0 \le x \le 2\pi$. Find the values of p and q.

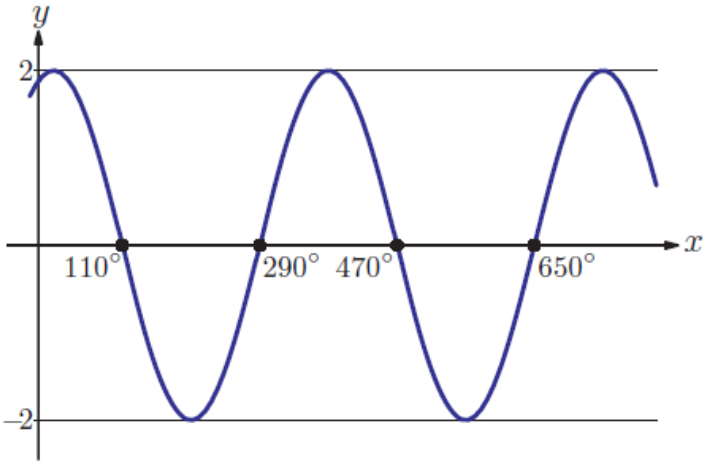


[3 marks]

Question (3)

The graph shown below has equation $y = a\cos(x - b)$ for $0° \le x \le 720°$.

Find the values of a and b.



[3 marks]

Question (4)

(a) On the same set of axes sketch the graphs of
$y = 1 + \sin 2x$ and $y = 2\cos x$ for $0 \leq x \leq 2\pi$.

(b) Hence state the number of solutions of the equation
$1 + \sin 2x = 2\cos x$ for $0 \leq x \leq 2\pi$.

(c) Write down the number of solutions of the equation
$1 + \sin 2x = 2\cos x$ for $-2\pi \leq x \leq 6\pi$. *[6 marks]*

Question (7)

(a) Sketch the graph of $y = 2\cos(x + 60^\circ)$ for $x \in [0^\circ, 360^\circ]$.

(b) Find the coordinates of the maximum and minimum points on the graph.

(c) Write down the coordinates the maximum and minimum points on the graph of
$y = 2\cos(x + 60^\circ) - 1$ for $x \in [0^\circ, 360^\circ]$. *[6 marks]*

Answers:

Q1)

(a) Amp: 3 Period: $\frac{\pi}{2}$

(b) Amp: ∞ Period: $\frac{\pi}{3}$

(c) Amp: 1 Period: $\frac{2\pi}{3}$

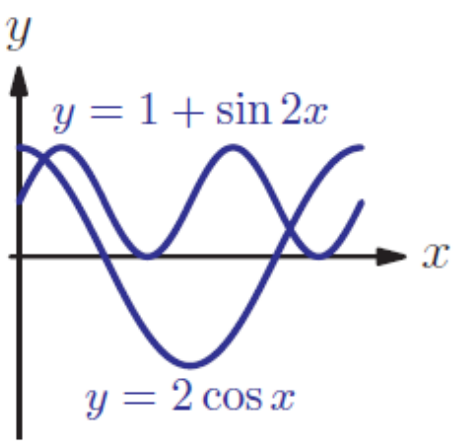
(d) Amp: 2 Period: 2

Q2) $p = 5, q = 2$

Q3) $a = 2, b = 20°$

Q4)

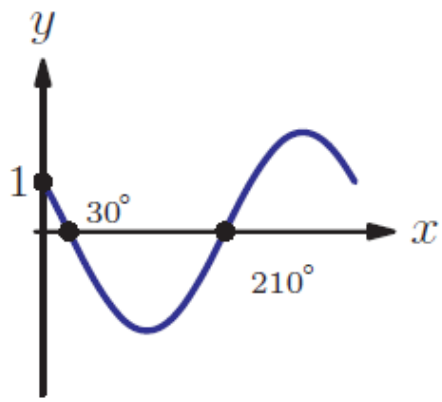
(a)



(b) 2 (c) 8

Q5)

(a)



(b) $(120°,-2), (300°,2)$

(c) $(120°,-3), (300°,1)$