

1. Conversion to radian.

a) 130°

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

$$130^\circ = \frac{130 \times \pi}{180} = \frac{13\pi}{18}$$

$$= \frac{13}{18}\pi \text{ or } 2.3 \text{ radians.}$$

b) 315°

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

$$315^\circ = \frac{315 \times \pi}{180} = \frac{7\pi}{4}$$

$$= \frac{7}{4}\pi \text{ or } 5.5 \text{ radians}$$

c) 450°

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

$$450^\circ = \frac{450 \times \pi}{180} = \frac{5\pi}{2}$$

$$= \frac{5}{2}\pi \text{ or } 7.9 \text{ radians}$$

2. Conversion to degrees

a) 2.5

$$1^\circ \text{ radian} = \frac{180}{\pi}$$

$$2.5 \text{ radians} = \frac{2.5 \times 180}{\pi} = \frac{450}{\pi}$$

$$= 143.239^\circ$$

$$= 143.2^\circ$$

b) 0.5

$$= 0.5 \times \frac{180}{\pi} = \frac{90}{\pi}$$

$$= 28.6478^\circ$$

$$= 28.6^\circ$$

c) $\frac{5\pi}{2}$

$$1 \text{ radian} = \frac{180}{\pi}$$

$$\frac{5\pi}{2} = \frac{5\pi \times 180}{2\pi} = 450^\circ$$

$$= 450^\circ$$

3. $y = \cos x$ $[0^\circ, 720^\circ]$

$$\cos x = 1$$

$$x = \cos^{-1}(1)$$

$$x = 0^\circ$$

$$\cos 2\pi = 1$$

$$x = 2\pi = 360^\circ$$

$$x = 360^\circ$$

$$\cos 2\pi + \theta = \cos \theta = 1$$

$$\cos(2\pi + 0) = \cos 0$$

$$\cos(2\pi + 2\pi) = 1$$

$$\cos 4\pi = 1$$

$$x = 4\pi = 720^\circ$$

$$x = 0^\circ, 360^\circ, 720^\circ \quad [0, 720]$$

b) $\cos x = 0$

$$\cos x = 0$$

$$x = \cos^{-1}(0)$$

$$x = 90^\circ$$

$$\cos(2\pi - 90) = \cos 270^\circ = 0$$

$$x = 270^\circ$$

$$\cos(4\pi - 90) = \cos 630^\circ = 0$$

$$x = 630^\circ$$

$$x = 90^\circ, 270^\circ, 630^\circ \quad [0^\circ, 720^\circ]$$

Question 4

	(a)	(b)	(c)	(d)
Range	$[1, 11]$	$[-3, 13]$	$[-2, 4]$	$[-3.5, -2.5]$
Amplitude	5	8	3	0.5
Period	3	8	π	12.57°
Possible horizontal translation	0	+3	-30°	-1
Equation of middle line	$y=6$	$y=5$	$y=1$	$y=-3.0$

5 (a) $y = 2 \sin(\frac{1}{2}x)$

(b) $y = 5 \sin x + 1$

6.

