

**Tutorial 10 Trigonometric ratios and their graphs**

1. Find the value of (a)  $\sin 47^\circ$  and (b)  $\cos 147^\circ$ .
2. Evaluate  $\frac{\sin 25^\circ \tan 125^\circ}{\cos 225^\circ}$ .
3. Find the maximum and minimum value of the function  $y = 3 \cos(2x + p)$ .
4. The price of a certain commodity product is represented by the function  $y = 3 \sin x^\circ + 4 \cos x^\circ$  where  $y$  represent the price and  $x$  represent time.
  - (a) Draw the graph of  $y = 3 \sin x^\circ + 4 \cos x^\circ$  for values of  $x$  from 0 to 90.
  - (b) Find the maximum price of the product.
  - (c) Find the time correspond to a price of 3.5 units.
5. The height of tidal waves in a certain location is represented by the function  $y = a \sin\left[\frac{2p}{l}(x - vt)\right]$  where  $x$  represents the distance of the tidal wave measured from a certain fixed point,  $\lambda$  represents the wavelength,  $v$  represents the speed of the wave and  $a$  is a constant. Given  $a = 4$ ,  $\lambda = 18$ ,  $x = 0$  and  $v = 1.5$ . Find the value of  $y$  for  $t = 0, 1, 2, 3$  and  $4$ .

**Solutions to tutorial 12**

1 a. 0.7314 b. -0.8387 (from calculator)

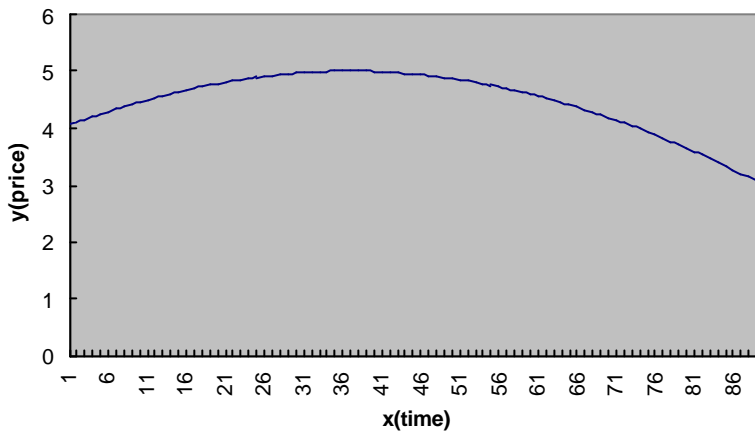
2 0.8536 (from calculator)

3. max value = 3; min value = -3

4. a. Construct a table for x between 0 to 90

x	0	10	20	30	40	50	60	70	80	90
y	4	4.46	4.78	4.96	4.99	4.87	4.60	4.19	3.64	3

**price against time graph**



b. From the curve, maximum price  $y = 5$  units

c. From the curve, when  $y = 3.5$ ,  $x = 82$  units

5. Now,  $y = 4 \sin(-30t)^\circ$

t	0	1	2	3	4
y	0	-2	-3.464	-4	-3.464