

$$1. \cos 90^\circ = 0$$

$$\cos 180^\circ = -1$$

$$\cos 270^\circ = \cos(270-180) \\ = \cos 90^\circ = 0$$

$$\cos 450^\circ = \cos(450-360) \\ = \cos 90^\circ = 0$$

(B)

$$2. y = 1 + \sin x$$

The set of values of the dependent variable for which a function is defined.

$$\text{Range } -1 \leq \sin x \leq 1$$

$$-1+1 \leq \sin x \leq 1+1$$

$$0 \leq \sin x + 1 \leq 2$$

$$\text{range } 0 \leq f(x) \leq 2$$

$$\text{Interval } [0, 2]$$

(B)

3. Midline of a graph is the line parallel to the x-axis halfway between the graph.  
Midline -  $y = 2$ .

(A)

$$4. y = 3 \sin 2x - 1$$

$$\text{Period} = \frac{2\pi}{2} = \pi$$

(A)

5. Amplitude is the highest point of a curve from midline.

$$\text{Amplitude} = 5 - 3 = 2$$

(A)

6. Period is the length at which a graph repeats itself.

$$\text{Period} = 2.5$$

(B)

$$7. \text{Midline } 1 \\ \text{Amplitude} = 5 - 10 = -5$$

$$\text{Midline} \\ \text{Amplitude} \Rightarrow y = -5$$

(B)

$$8. y = 3 \sin 2(x - 90^\circ) - 3$$

(B)

$$9. \text{range } y\text{-value}$$

$$[-4, 4]$$

$$\text{range } \{y \mid -4 \leq y \leq 4, y \in \mathbb{R}\}$$

(B)

$$10. y = 3 \sin 2(x - 90^\circ) - 1$$

$$\text{Midline } y = -1$$

(B)

| x | 0   | 1   | 2   | 3   | 4   | 5   | 6   |
|---|-----|-----|-----|-----|-----|-----|-----|
| y | 1.0 | 2.5 | 4.0 | 2.5 | 1.0 | 2.5 | 4.0 |

(B)

2.  $d(t) = 4.37 \cos 0.017t + 12.52$

$t = 61$

$d(61) = 4.37 \cos 0.017(61) + 12.52$

$d(61) = 4.37 \cos 1.037 + 12.52$

$d(61) = 2.2235 + 12.52$

$d(61) = 14.7435$

$d(61) \approx 14.74 \text{ h}$

(A)

13.  $d(t) = 4.37 \cos 0.017t + 12.52$   
June 20, 2012  $t = 0$

$d(0) = 4.37 \cos 0.017(0) + 12.52$

$d(0) = 4.37 \cos 0 + 12.52$

$d(0) = 4.37 + 12.52$

$d(0) = 16.89 \text{ hrs}$

(C)

14. A period - 6.

B period - 8.75

C period - 12. ✓

D period - 6.

(C)

Problem

(1) Range:  $\{y | 0 \leq y \leq 14, y \in \mathbb{R}\}$   
 $[0, 14]$

Midline.

Problem

1. Range:  $\{y | -1 \leq y \leq 5, y \in \mathbb{R}\}$

Midline:  $y = 2$ .

Amplitude:  $5 - 2 = 3$ .

Period:  $= 12$ .

2. Graph A matches equation.

$y = 2 \cos(x - 120^\circ) + 4$

Period  $= 360^\circ$

Range  $\{y | 2 \leq y \leq 6, y \in \mathbb{R}\}$ .

y-intercept  $(0, 3)$

Midline  $y = 4$ .

Graph B matches equation.

Period  $= 360^\circ$

$y = 2 \cos(x - 6)$

Range  $\{y | -2 \leq y \leq 2, y \in \mathbb{R}\}$ .

y-intercept  $(0, 1)$

Midline  $y = 0$ .

3.  $h(t) = -14 \cos 3.2t + 16$

g)  $h(0) = -14 \cos 3.2(0) + 16$

$h(0) = -14 \cos 0 + 16$

$h(0) = -14 + 16 = 2$

$h(1) = -14 \cos 3.2(1) + 16$

$h(1) = 29.98$

Minimum  $= 2 \text{ m}$ .

Maximum  $= 30 \text{ m}$ .

$$b) h(t) = -14 \cos 3.2t + 16$$

$$\text{Period} = \frac{2\pi}{|3.2|}$$

$$= 1.9635$$

$$\approx 1.96$$

$$c) h(t) = -14 \cos 3.2t + 16$$

$$20 = -14 \cos 3.2t + 16$$

$$-14 \cos 3.2t = 4$$

$$\cos 3.2t = -\frac{4}{14}$$

$$\cos 3.2t = -0.1667$$

$$3.2t = \cos^{-1} -0.1667$$

$$3.2t = 99.6$$

$$t = \frac{99.6}{3.2}$$

$$= 31.13$$

$$t = 31.13 \text{ minute.}$$

4. a) Period.  $0.3 - 0 = 0.3$

b)  $x = 0.7$ .

$y = 3$

a)  $y = 4713.85 \sin(0.02x + 1.43) - 4692.59$

$a = 4713.85$

$b = 0.02$ .

$c = 1.43$

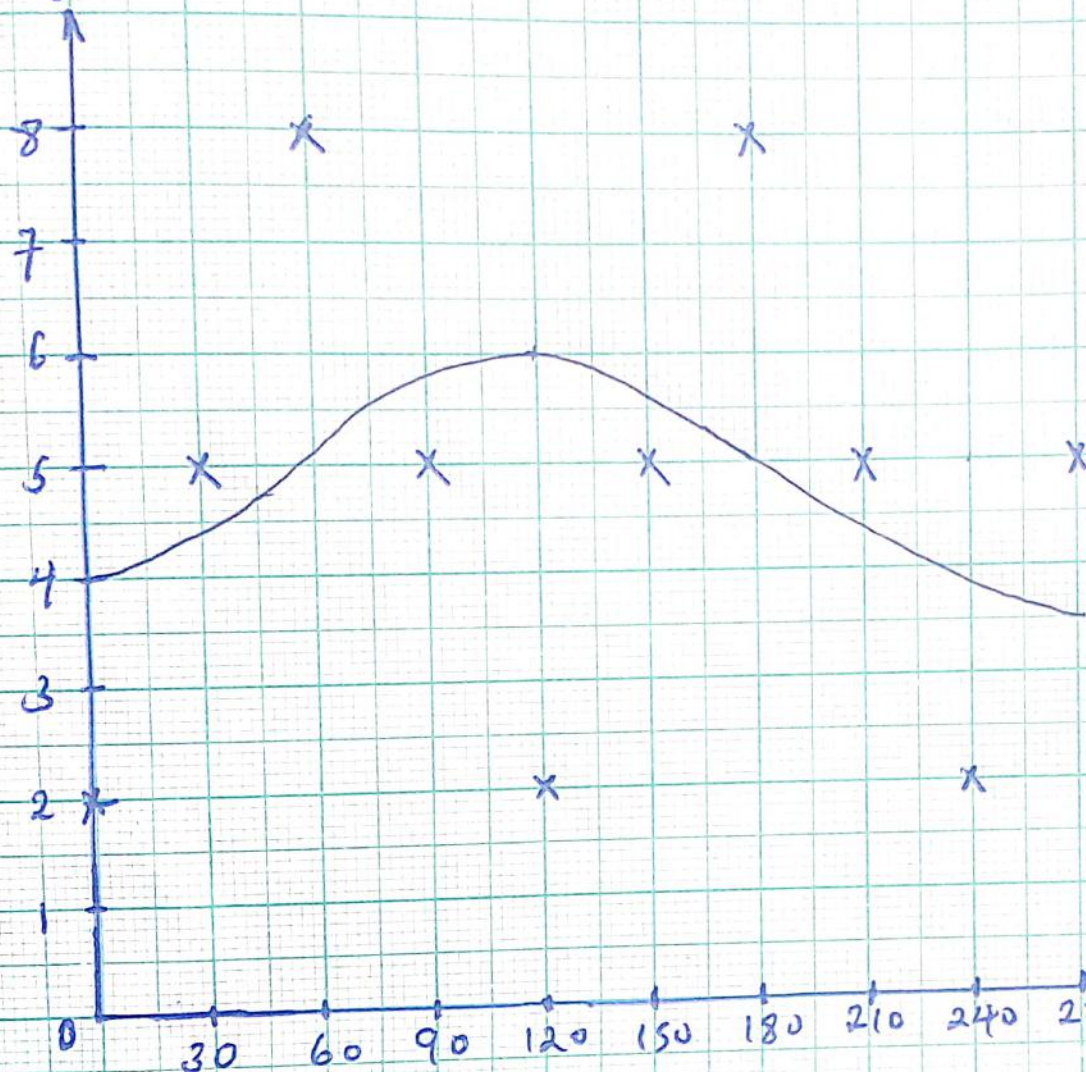
$d = -4692.59$ .

b)  $x = 10$

$y = 4713.85 \sin(0.2 + 1.43) - 4692.59$

$y = 13.00$       October =  $13^{\circ}\text{C}$

6.a) y-axis



b) amplitude = 0.93  
 period =  $360^\circ$   
 midline =  $y = 4.5$

c)  $y = 0.93 \sin(0.017x - 0.64) + 4.5$

$y = 0.93 \sin(0.02x - 0.64) + 4.5$

d) i) d

ii) a