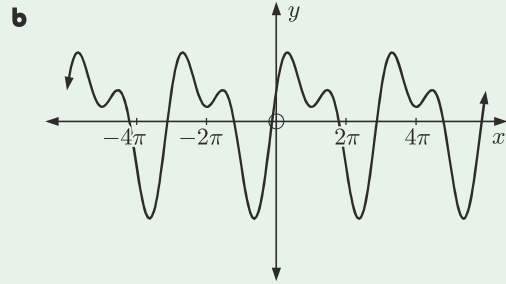
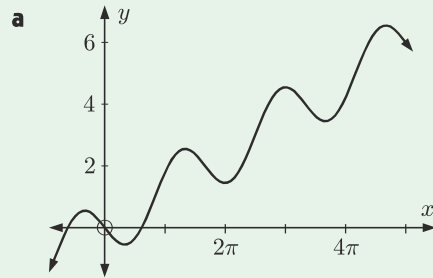


**REVIEW SET 10A**

**NON-CALCULATOR**

1 Which of the following graphs display periodic behaviour?



2 Draw the graph of  $y = 4 \sin x$  for  $0 \leq x \leq 2\pi$ .

3 State the minimum and maximum values of:

- a**  $1 + \sin x$       **b**  $-2 \cos 3x$

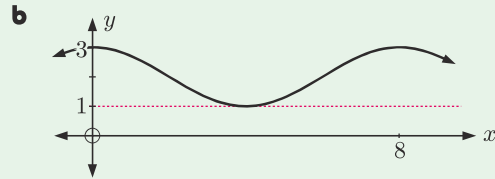
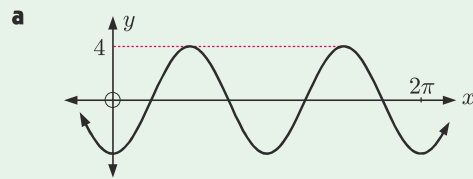
4 State the period of:

- a**  $y = 4 \sin(\frac{x}{5})$       **b**  $y = -2 \cos(4x)$       **c**  $y = 4 \cos(\frac{x}{2}) + 4$       **d**  $y = \frac{1}{2} \tan(3x)$

5 Complete the table:

Function	Period	Amplitude	Domain	Range
$y = -3 \sin(\frac{x}{4}) + 1$				
$y = \tan 2x$				
$y = 3 \cos \pi x$				

6 Find the cosine function represented in each of the following graphs:



**REVIEW SET 10B**

**CALCULATOR**

1 For each set of data below, draw a scatter diagram and state if the data exhibits approximately periodic behaviour.

**a**

$x$	0	1	2	3	4	5	6	7	8	9	10	11	12
$y$	2.7	0.8	-1.7	-3	-2.1	0.3	2.5	2.9	1.3	-1.3	-2.9	-2.5	-0.3

**b**

$x$	0	1	2	3	4	5	6	7	8	9
$y$	5	3.5	6	-1.5	4	-2.5	-0.8	0.9	2.6	4.3

2 Draw the graph of  $y = \sin 3x$  for  $0 \leq x \leq 2\pi$ .

3 State the period of:      **a**  $y = 4 \sin(\frac{x}{3})$       **b**  $y = -2 \tan 4x$

4 Draw the graph of  $y = 0.6 \cos(2.3x)$  for  $0 \leq x \leq 5$ .

- 5 A robot on Mars records the temperature every Mars day. A summary series, showing every one hundredth Mars day, is shown in the table below.

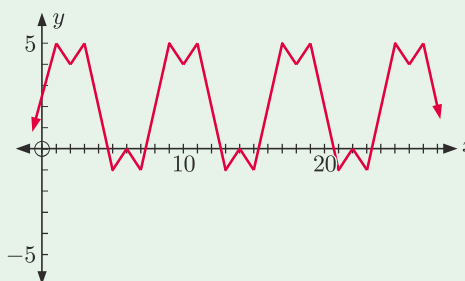
<i>Number of Mars days</i>	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
<i>Temp. (°C)</i>	-43	-15	-5	-21	-59	-79	-68	-50	-27	-8	-15	-70	-78	-68

- a Find the maximum and minimum temperatures recorded by the robot.  
 b Find a sine model for the temperature  $T$  in terms of the number of Mars days  $n$ .  
 c Use this information to estimate the length of a Mars year.
- 6 State the minimum and maximum values of:  
 a  $y = 5 \sin x - 3$                       b  $y = \frac{1}{3} \cos x + 1$

### REVIEW SET 10C

- 1 Consider the graph alongside.

- a Explain why this graph shows periodic behaviour.  
 b State:  
 i the period  
 ii the maximum value  
 iii the minimum value



- 2 Find  $b$  given that the function  $y = \sin bx$ ,  $b > 0$  has period:  
 a  $6\pi$                       b  $\frac{\pi}{12}$                       c 9
- 3 a Without using technology, draw the graph of  $f(x) = \sin(x - \frac{\pi}{3}) + 2$  for  $0 \leq x \leq 2\pi$ .  
 b For what values of  $k$  will  $f(x) = k$  have solutions?
- 4 On the same set of axes, for the domain  $0 \leq x \leq 2\pi$ , sketch:  
 a  $y = \cos x$  and  $y = \cos x - 3$                       b  $y = \cos x$  and  $y = \cos(x - \frac{\pi}{4})$   
 c  $y = \cos x$  and  $y = 3 \cos 2x$                       d  $y = \cos x$  and  $y = 2 \cos(x - \frac{\pi}{3}) + 3$
- 5 The table below gives the mean monthly maximum temperature for Perth Airport in Western Australia.

<i>Month</i>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Temp (°C)</i>	31.5	31.8	29.5	25.4	21.5	18.8	17.7	18.3	20.1	22.4	25.5	28.8

- a A sine function of the form  $T \approx a \sin(b(t - c)) + d$  is used to model the data. Find good estimates of the constants  $a$ ,  $b$ ,  $c$ , and  $d$  without using technology. Use Jan  $\equiv$  1, Feb  $\equiv$  2, and so on.  
 b Check your answer to a using technology. How well does your model fit?
- 6 State the transformation(s) which map(s):  
 a  $y = \cos x$  onto  $y = \cos(x - \frac{\pi}{3}) + 1$                       b  $y = \tan x$  onto  $y = -2 \tan x$   
 c  $y = \sin x$  onto  $y = \sin(3x)$