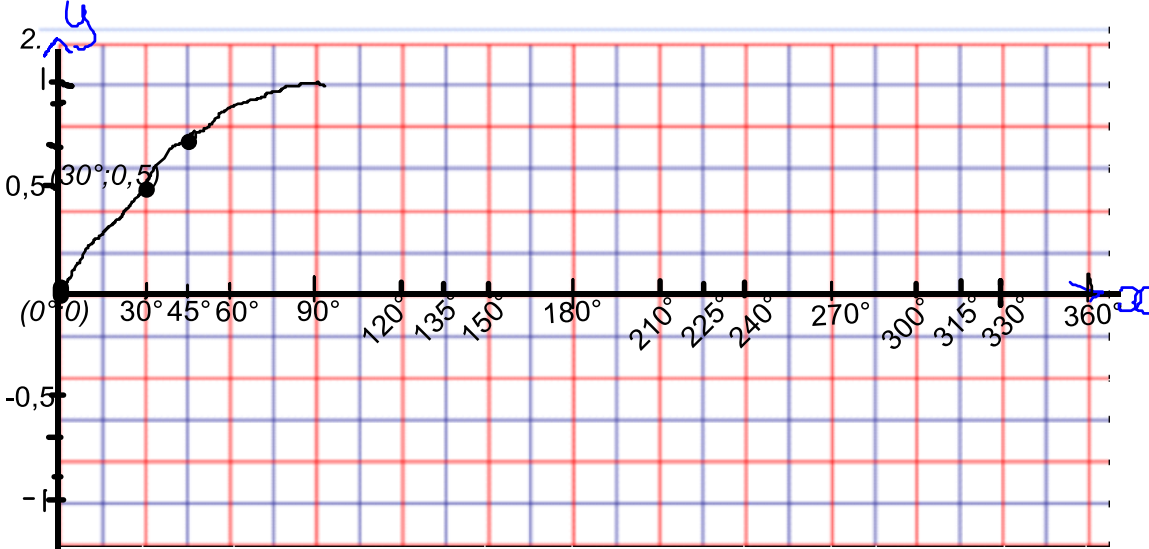LJE INTRO TO TRIG GRAPHS Complete this worksheet for Tuesday   ONLY the first 3 graphs on page 1 and 2

1. y = sin x   1. Complete the table by using your calculator to find sin of each angle given.
                  2. Plot the points on the graph paper below to get the curve for y = sin x
                  3. Answer the questions below the sketch

1.

x	0°	30°	45°	60°	90°	120°	135°	150°	180°	210°	225°	240°	270°	300°	315°	330°	360°
y = sin x	sin0 =0	sin30 =0,5	0,7														

Plot: (0°;0) (30°;0,5)

2.

3. a) The maximum value for sin x is .... and the minimum value is ....
   b) The amplitude (distance from position of rest) is ......unit(s)
   c) The period (how many degrees the curve goes before repeating itself) is...........

2. y = cos x   1. Complete the table by using your calculator to find cos of each angle given.   p1 pt2
                  2. Plot the points on the graph paper below to get the curve for   y = cos x
                  3. Answer the questions below the sketch

1.

x	0°	30°	45°	60°	90°	120°	135°	150°	180°	210°	225°	240°	270°	300°	315°	330°	360°
y = cos x	cos0 =1	cos30 =0,9	0,7														

Plot: (0°;0) (30°;0,9)

2.

3. a) The maximum value for cos x is .... and the minimum value is ....
   b) The amplitude (distance from position of rest) is ......unit(s)
   c) The period (how many degrees the curve goes before repeating itself) is...........
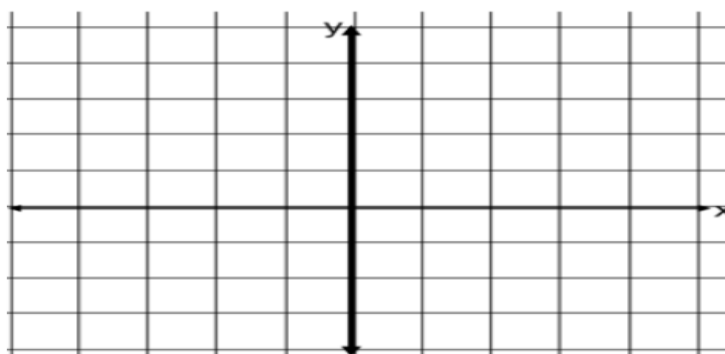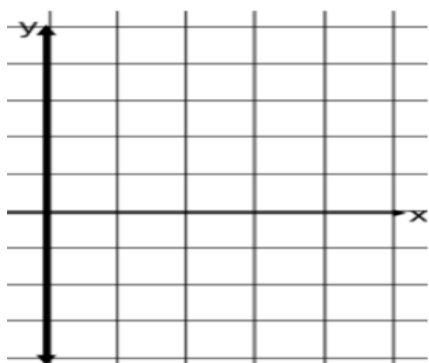
3. y = tan x   1. Complete the table using your calculator to find tan x for each value of x given.
                  2. Plot the points on the grid provided to get the curve of y = tan x.
                  3. Answer the questions below the sketch.

1.

x	0°															
y =																

2.

3. a) An asymptote is ....

    b) The equations of the asymptotes of y = tan x are: ....

    c) The period of the graph of y = tan x is ....

    d) Complete the co-ordinates of the following and make sure you always plot them

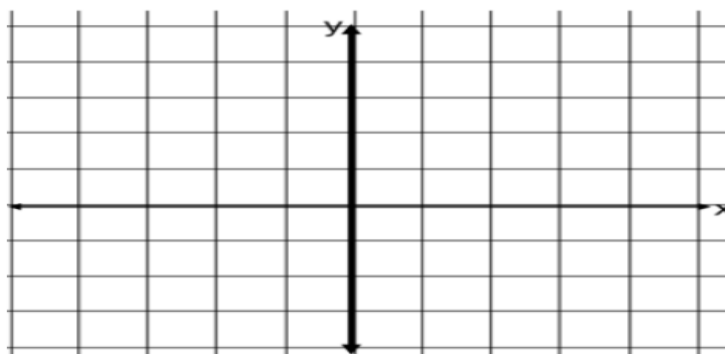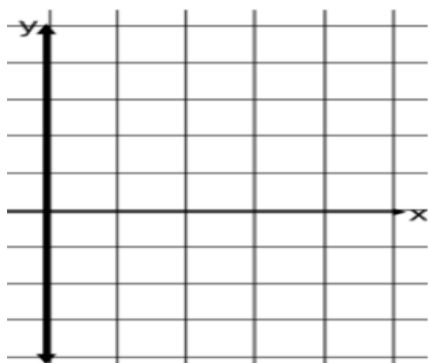   (45°;   ), (135°;   ), (225°;   ), (315°;   ),

SUMMARY OF TRIG GRAPHS:

Sine and cos graphs:

1. Starting point for sin x is ……………..   Starting point for cos x is …………………

2. max value is ………………..   Min value is ………………..

3. amplitude is ….

4. period is …………………….. therefore …………….. units

5. double the ratio [y = 2 sin x] $\longrightarrow$ double the amplitude

6. double the angle [y = sin 2x] $\longrightarrow$ halve the period $\therefore$ halve the units

7. Neg of graph [y = - sin x] $\longrightarrow$ turn graph upside down/ reflection in x-axis/ y-val's change sign

8. y = sin x + c [y = sin x + 1 or y = cos x – 2] $\longrightarrow$ sin graph moves up 1 unit or cos graph moves down 2.

Y = tan x:

1. Starting point for y = tan x is …………………..

2. asymptotes at ……………………………………….. & equations of asymptotes are …………………………………

3. always show the points: ……

4. Period is ……………………….. $\therefore$ ………………….. units

LJE Trig Graph Practice

For 1-16 draw rough graphs of:

1. y = sinx   -180° ≤ x ≤ 180°

2. y = cosx   -180° ≤ x ≤ 180°

3 a) y = sinx and y = cosx -180° ≤ x ≤ 180°

4. y = - sin x   -180° ≤ x ≤ 180°

5. y = - cosx   -180° ≤ x ≤ 180°

6. y = tanx   -180° ≤ x ≤ 180°

7. y = sinx + 1   0° ≤ x ≤ 360°

8. y = cosx - 1   0° ≤ x ≤ 360°

9. y = 2.sinx   -0° ≤ x ≤ 360°

10. y = ½ cosx   -0° ≤ x ≤ 360°

11 a) y = sinx and y = 2.cosx   -180° ≤ x ≤ 180°

`12. y = - 2.sin x   -180° ≤ x ≤ 180°

13. y = - ½.cosx   -180° ≤ x ≤ 180°

14. y = 2.tanx   -180° ≤ x ≤ 180°

15. y = sinx - 1   0° ≤ x ≤ 360°

16. y = cosx + 1   0° ≤ x ≤ 360°

17. For q 3 – 5, and 7-10 Give
   a) The domain
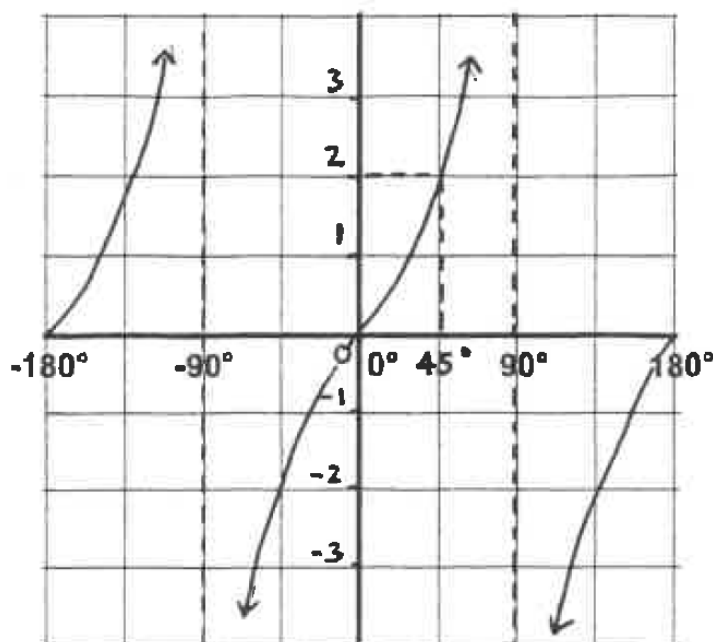
   b) The range

   c) The period

   d) The amplitude

   e) The maximum value

18. For 6 and 14,   a) give the y value when x = 45°
                      b) give the equations of the asymptotes
                      c) give the period

4.1 Study the graph given and answer the questions that follow. The equation defining this graph is given as: $y = a \tan x$ for $x \in [-180°; 180°]$

4.1 1   What is the value of a ? (1)

4.1.2   What is the period of this graph? (1)

4.1.3   If the graph were shifted upwards by 2 units, what would its equation be? (1)

4.2   Answer the following questions:

4.2.1   On your own set of axes, for $0° \le x \le 360°$, draw the graph of

$$g : y = \cos x - 1$$ (3)

4.2.2   What is the maximum value of this graph? (1)

4.2.3   What is the amplitude of this graph? (1)

4.2.4   For what values of x is $y = \cos x - 1 = 0$? (2)

7.1   On THE SAME SET OF AXES (on the answer sheet given to you) draw the graphs of $f(x) = y = 2 \sin x$ and $g(x) = y = \cos x - 1$ for $x \in [0°; 360°]$. Make sure you show where the graphs cut the axes and any turning points and which graph is f or g. (6)

7.2   What is the amplitude of f ? (1)
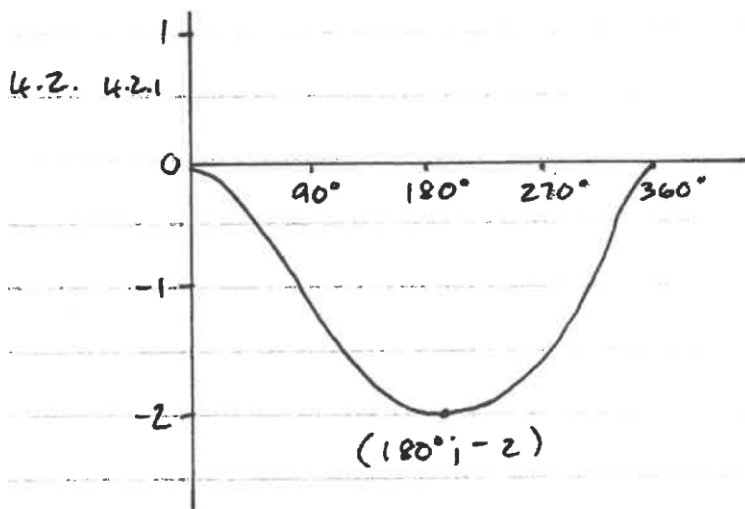
7.3   What is the period of g ? (1)

7.4   What is the range of g ? (2)

MEMO

4.1 4.1.1 $a = 2$ ✓ (1)

   4.1.2 $180°$ ✓ (1)

   4.1.3 $y = 2\tan x + 2$ ✓ (1)
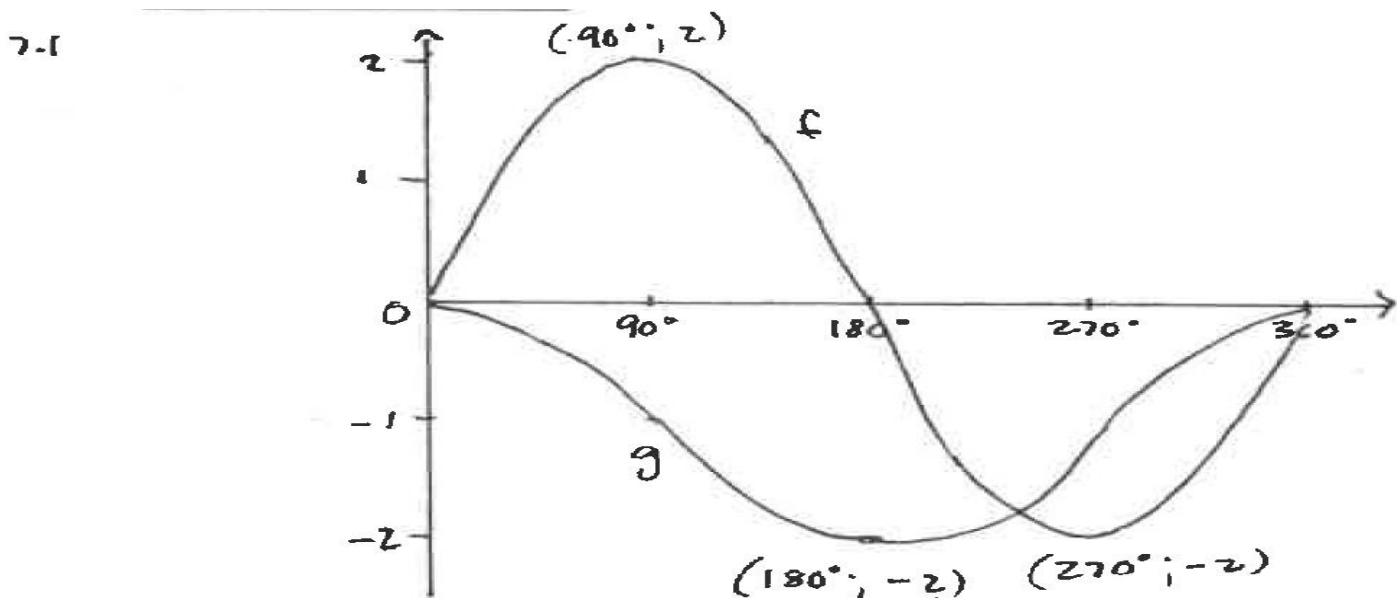
4.2 4.2.1

$(180°; -2)$

   x ints. / y int ✓
   T.P ✓
   Correct shape ✓ (3)

   4.2.2 Max. val. $= 0$ ✓ (1)

   4.2.3 Amplitude $= 1$ ✓ (1)

   4.2.4 $x = 0°$ and $x = 360°$ (2)
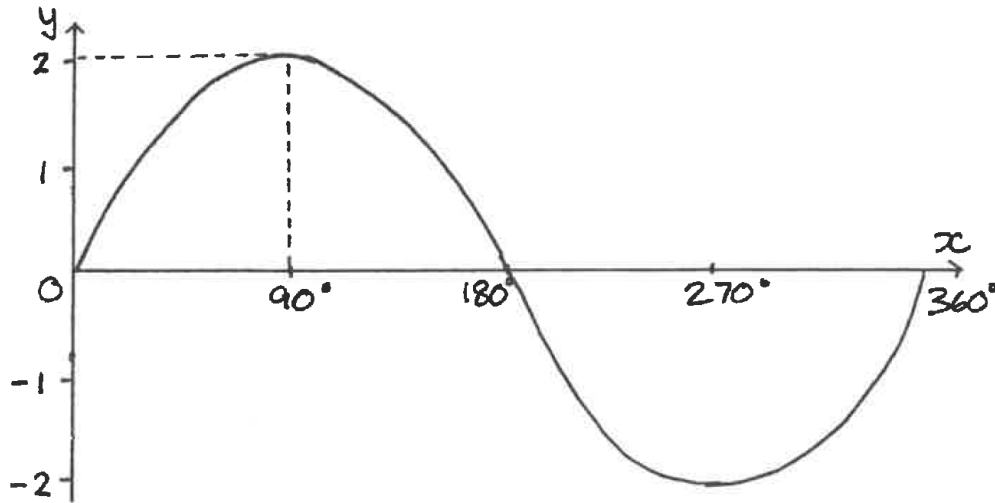
7.1

$(90°; 2)$

f

g

$(180°; -2)$ $(270°; -2)$

7.2   Amplitude of $f = 2$

7.3   Period of $g = 360°$

7.4 $-2 \leq y \leq 0$

5.1 The sketch below shows the graph of $y = f(x) = 2\sin x$:

5.1.1 What is the amplitude of f ?
5.1.2 What is the minimum value of f ?

5.2 On your own set of axes draw the graph of
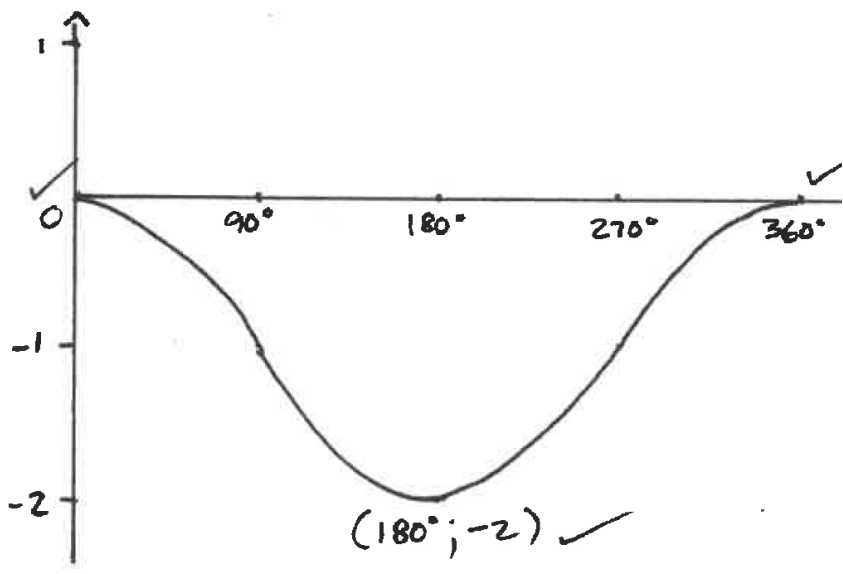$y = g(x) = \cos x - 1$ (for the interval $0° \le x \le 360°$).
5.2.1 What is the period of g ?
5.2.2 What is the range of g ?

The sketch for this question must be drawn on the answer sheet provided.

7.1 On the same set of axes, draw the graphs of $y = f(x) = 2\sin x$ and
$y = g(x) = \cos x - 1$ for $x \in [-180° ; 180°]$. All x and y intercepts, as
well as any turning points, must be shown. (5)

7.2 What is the period of graph f ? (1)

7.3 What is the minimum value of graph f ? (1)

7.4 What is the amplitude of graph g ? (1)

7.5 What is the range of graph g ? (2)

7.6 Give any one value of x for which $2\sin x = 0$. (1)

[11]

5.1 5.1.1   2 ✓   (1)

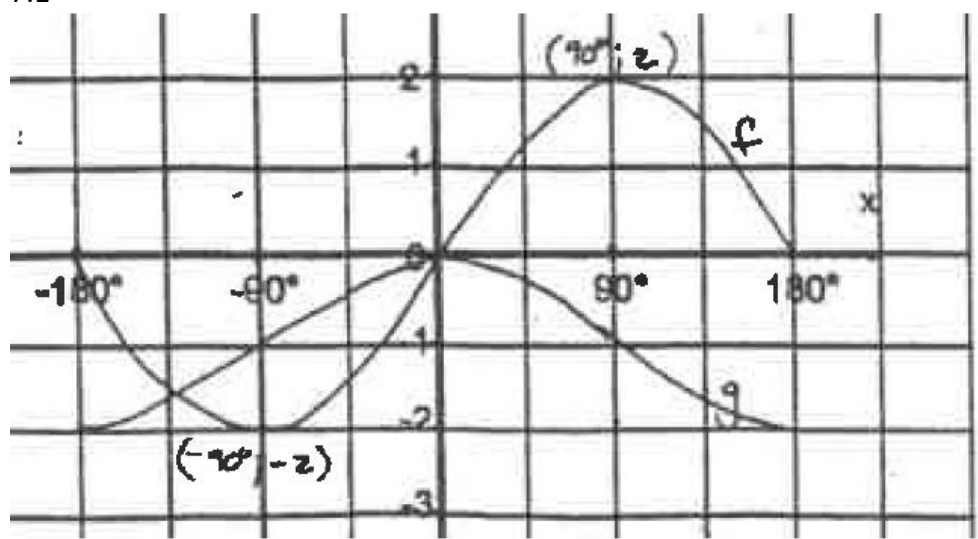5.1.2 −2 ✓   (1)

5.2

(180°; −2) ✓

5.2.1   360° ✓

5.2.2 −2 ≤ y ≤ 0   values ✓   correct inequa

7.

7.1

(90°; 2)

f

−180°   −90°   90°   180°

(−90°; −2)

f: T.P.s ✓
   x ints. ✓
   y int. ✓

g: T.P. ✓

Shape ie.
starts +
ends in
correct ✓
place

7.2   360° ✓   (1)

7.3   −2 ✓   (1)
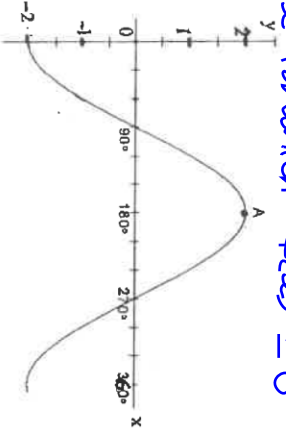
7.4   1 ✓   (1)

7.5   −2 ≤ y ≤ 0 ✓   (2)

7.6   x = −180°

      OR x = 0°

      OR x = 180°   ✓   (1)

GRADE 10 WS 3 ON GRAPHS.

QUESTION 6

The graph of the function $f(x) = a \cos x$ is drawn below:

6.1 What is the value of a? (1)

6.2 What is the amplitude of the graph? (1)

6.3 What is the period of $f(x)$? (1)

6.4 What are the co-ordinates of A, the turning point of the function $f(x)$ shown on the graph? (2)

6.5 If $g(x)$ is obtained by shifting $f(x)$ down 2 units, what will the new equation of $g(x)$ be? (1)
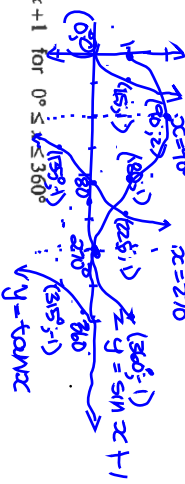
6.2 The diagram below represents the graphs of the functions $f(x) = a \cos x$ and $g(x) = \sin x + q$

6.2.1 What is the value of a? (1)

6.2.2 Write down the value of q. (1)

6.2.3 What is the range of g? (2) $y \in [0;2]$ $\{y \mid 0 \leq y \leq 2\}$

6.2.4 For which values of x is $g(x) - f(x) = 2$? (2) $360; f(x)+2$ $360; f(x)+2$

6.2.5 " " " " " $g(x) < f(x)$ (2) $x \in (270°;360°)$

$g(x) < f(x)$ the below graph $270 < x < 360$

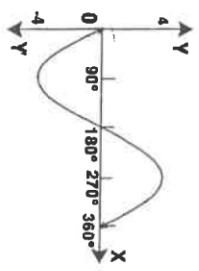**6.6** Val's $g = x$ for which $f(x) \geq 0$ $90° \leq x \leq 270°$

$x \in [90°;270°]$

C

6.2.1 Sketch neat graphs of $y = \tan x$ and $y = \sin x + 1$ for $0° \leq x \leq 360°$

6.2.2 What is the period of $y = \tan x$?

6.2.3 What is the amplitude of $y = \sin x + 1$?

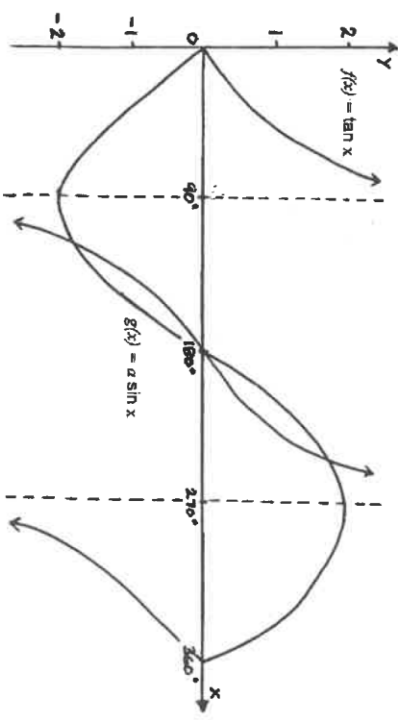## D QUESTION 7

7.1 Use the graph sketched alongside to answer the questions:

7.1.1 Write down the equation of the graph. $y = -4 \sin x$ (2)
7.1.2 State the period of the graph. (1)
7.1.3 State the domain of the graph. (1) $x \in [0°;360°]$

E QUESTION 6

The following graphs have been drawn below: $f(x) = \tan x$ and $g(x) = a \sin x$ $x \in [0°;360°]$ or $\{x \mid 0° \leq x \leq 360°\}$

6.1 Determine the value of a. (2)

6.2 If $f(x)$ is shifted 2 units downwards, it represents the function h. State the defining equation of h. (2)

6.3 Write down the values of x for $x \in [0°, 180°]$, for which $f(x) - g(x) = 0$. (2)

6.4 Write down the range of g. (1)

6.5 Write down the period of f. [8]