(50) Transforming Graphs (Trigonometry)

WORKING AT D/E

(1) On separate sets of axes, draw each graph for $0 \leq x \leq 360$ showing where the graph meets or crosses the coordinate axes. On your graph include the coordinates of any maximum or minimum points and the equations of any asymptotes.

(a) $y = 2\sin(x)$
(b) $y = \cos(x) + 1$
(c) $y = -\tan(x)$
(d) $y = \sin(x - 30)$
(e) $y = 3\cos(x)$
(f) $y = \cos(x + 60)$
(g) $y = -\cos(x)$
(h) $y = \sin(2x)$
(i) $y = \cos(0.5x)$
(j) $y = 2 + \sin(x)$
(k) $y = \tan(-x)$
(l) $y = 1 - \cos(x)$

(2) The graph of $y = \cos(x) + k$, where k is a positive constant, doesn't meet the x axis. Explain why $k > 1$.

WORKING AT B/C

(1) The graph of $y = k\cos(x)$ has a maximum point with coordinates $(360, \sqrt{2})$
(a) Find the value of k
(b) Find the coordinates of the first minimum point on the graph for $x > 0$

(2) The graph of $y = \tan(x - a)$ where a is a positive constant has an asymptote when $x = 120^0$
(a) Explain why a could be 30^0
(b) Give any other possible value of a

(3) Sketch the graph of $y = \sin(x) + a$, for $a > 1$ in the interval $0 \leq x \leq 360$.
Show the coordinates of the minimum and maximum point and where the graph crosses the y axis giving your answers in terms of a

WORKING AT A*/A

(1) (a) The graph of $y = \sin(ax)$, where a is a positive constant, meets the x axis in 7 places in the interval $0 \leq x \leq 360$. Find the value of a.

(b) The graph of (a) The graph of $y = \sin(bx)$, where b is a positive constant, doesn't meet the x axis in the interval $0 < x \leq 360$. Find the possible set of values for the constant b.

(2) The diagram below shows the part of the graph of $y = a\cos(x + b)$ where a and b are constants.

$(225,2)$
$(135,0)$
$(45,-2)$
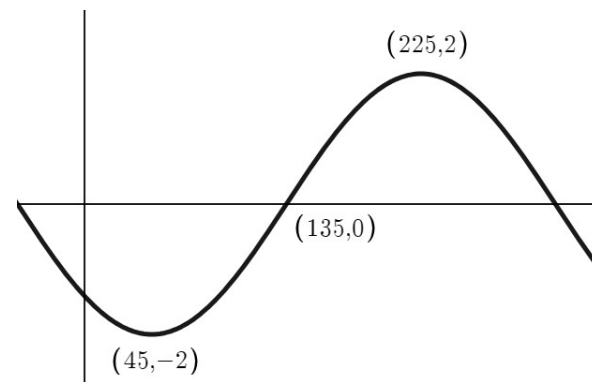
Find possible values for a and b:
(a) If a is positive and b is negative
(b) If a is negative and b is negative
(c) If a is positive and b is negative
(d) If a is negative and b is positive

(3) Alan says that the graph of $y = \tan(kx)$ where k is a positive constant has a single asymptote in the interval $0 \leq x \leq 90^o$. Find the set of values of k that would satisfy this statement.