4-6I Evaluation- Transformations of Sinusoidal Functions

KNOWELDGE   /24

KNOWELDGE

24 MARKS

For the following functions, determine the amplitude, period, complete transformations, domain and range, and then sketch one cycle of the graph.
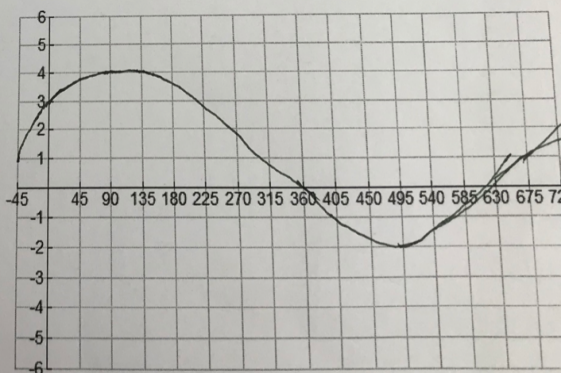
Marking Scheme (out of 12 marks each)

- 1 mark for the amplitude
- 1 mark for the period
- 4 marks for the complete transformations
- 1 mark for the domain

- 1 mark for the range
- 2 marks to transform the 5 key points listed below
- 2 marks to sketch the graph of the function

$$y = 3\sin\left[\frac{1}{2}(x + 45^0)\right] + 1$$

Amplitude	Period	Domain	Range
3	720^0	$-45^0 \le x \le 675^0$	$\{y \in R ; -2 \le y \le 4\}$
List (in words) the complete transformations	1. Vertical stretch factor 3. → 2. Horizontal stretch factor 2 3. Horizontal shift to left 45° → Vertical shift up		

x	y	→		
0	0	→	-45	1
90	1	→	135	4
180	0	→	315	1
270	-1	→	495	-2
360	0	→	675	1

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$y = 2\cos[3(x - 30^\circ)] + 2$			
Amplitude	**Period**	**Domain**	**Range**
2	120	$30^\circ \leq x \leq 150^\circ$	VER : $0 \leq y \leq 4$.
List (in words) the complete transformations	1. Vertical stretch factor 2 → 2. Horizontal stretch factor $\frac{1}{3}$ 3. Horizontal shift to right 30° → vertical shift up 2 unit.		

x	y	→		
0	1	→	30	4
90	0	→	60	2
180	-1	→	90	0
270	0	→	120	2
360	1	→	150	4