

4-6I Evaluation- Transformations of Sinusoidal Functions

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24 MARKS

For the following functions, determine the amplitude, period, complete transformations, domain and range, and then sketch one cycle of the graph.

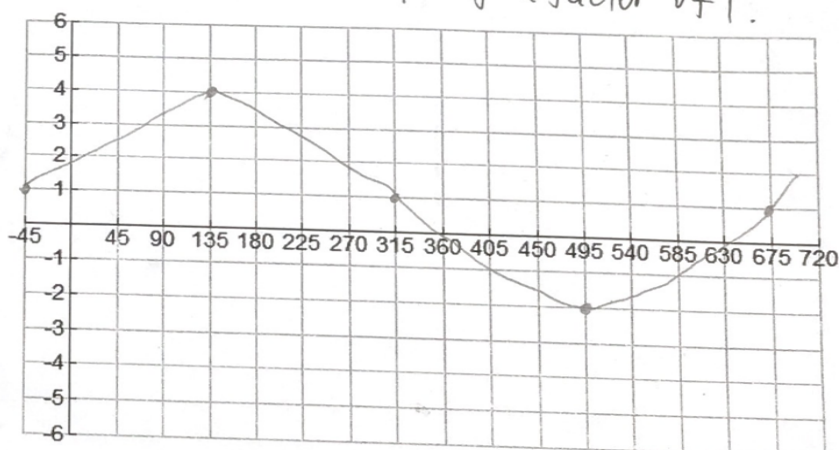
Marking Scheme (out of 12 marks each)

- 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

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

Amplitude	Period	Domain	Range
3	720°	$\{-45 \leq x \leq 675\}$	$\{-2 \leq y \leq 4, y \in \mathbb{R}\}$
List (in words) the complete transformations	The vertical stretch by a factor of 3. The horizontal stretch by a factor of 2 the horizontal translation by a factor of 45. move left The vertical translation moves up by a factor of 1.		

x	y	→		
0	0	→	$2x - 45^\circ$	$3y + 1$
90	1	→	-45	1
180	0	→	135	4
270	-1	→	315	1
360	0	→	495	-2
			675	1



$y = 2 \cos[3(x - 30^\circ)] + 2$			
Amplitude	Period	Domain	Range
2	120°	$\{30 \leq x \leq 150\}$	$\{2 \leq y \leq 4, y \in \mathbb{R}\}$
List (in words) the complete transformations	The vertical stretch by a factor of 2. The horizontal compression by a factor of $\frac{1}{3}$. The horizontal translation by a factor of 30. move right Then Vertical translation by a factor of 2. move up		

x	y	→	$\frac{1}{3}x + 30$	$2y + 2$
0	1	→	30	4
90	0	→	60	2
180	-1	→	90	0
270	0	→	120	2
360	1	→	150	4

