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MCR3U

Due 11:59 PM Wednesday 6 March

Rosedale Academy

4-6I Evaluation- Transformations of Sinusoidal Functions

KNOWLEDGE

20/24

KNOWLEDGE

24 MARKS

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

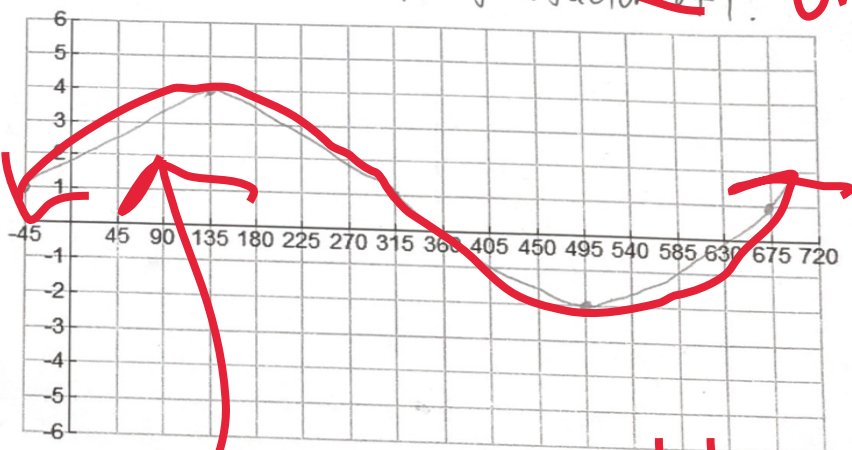
Marking Scheme (out of 12 marks each)

- 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

10

$y = 3 \sin \left[\frac{1}{2} (x + 45^\circ) \right] + 1$			
Amplitude 3	Period 720°	Domain $\{ -45 \leq x \leq 675 \}$	Range $\{ -2 \leq y \leq 4, y \in \mathbb{R} \}$
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 45. The vertical translation moves up by a factor of 1 units.		

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



Curve must be drawn smooth

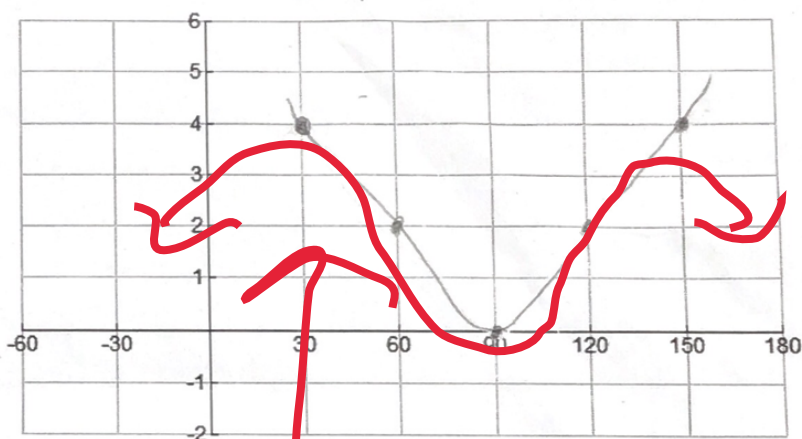
10

$y = 2 \cos[3(x - 30^\circ)] + 2$			
Amplitude <u>2</u> ✓	Period <u>120°</u> ✓	Domain <u>$\{30 \leq x \leq 150\}$</u> ✓	Range <u>$\{2 \leq y \leq 4, y \in \mathbb{R}\}$</u> ✓
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 The vertical translation by a factor of 2 ✓ move up		

units
units

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

✓ ✓



must be curved - 1