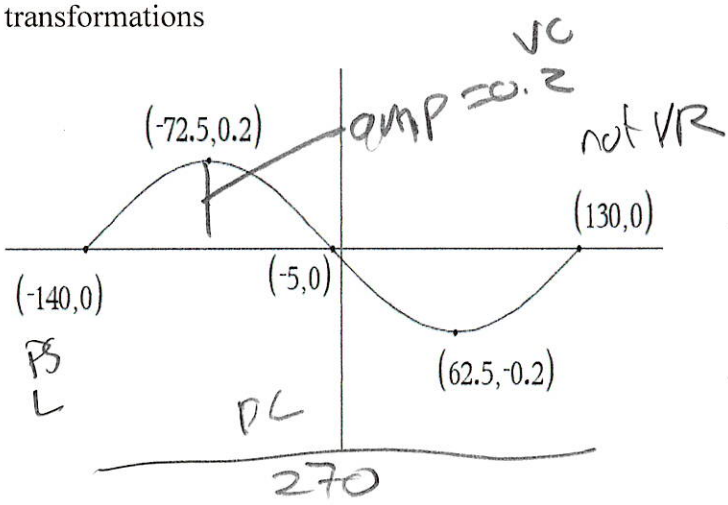
Name_____

2nd hour	3rd hour	4th hour
5th hour	6th hour	7th hour

SA Transformations of Sine and Cosine
Writing a Function from its Graph
Graphing a Function from its Function

Write the equation of the given trigonometric function, answer the related questions, and select the related transformations



1. Write the trigonometric function in the given graph in both formats

General Trigonometric Function

$f(x) = 0.2\sin\left(\frac{4}{3}x + \frac{560}{3}\right)$

Translated Trigonometric Function

$f(x) = 0.2\sin\left(\frac{4}{3}(x+140)\right)$

2. Complete the related table

A	B	C	D	Amplitude	Phase shift	Period Length	State implied period
0.2	$\frac{4}{3}$	$\frac{560}{3}$ $\frac{3}{186.6}$	0	0.2	140 L	270	[-140, 130)

3. Circle the related transformations

amp < 1 ; PL < 360

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp 0.2 ; PL = 270

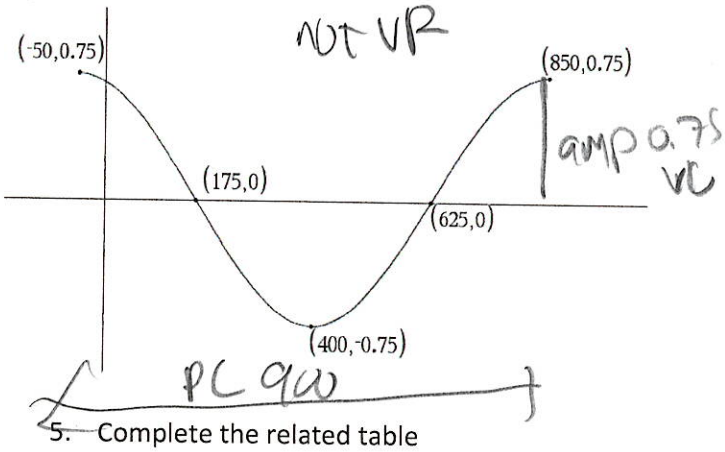
Show any related work here

$PL = 130 - -140 = 270 \rightarrow HC < 360$

$B = \frac{360}{PL} = \frac{360}{270} = \frac{4}{3}$

$\frac{4}{3}(x+140) \Rightarrow \frac{4}{3}x + \frac{560}{3} = 1.\overline{3}x + 186.\overline{6}$

Extra Credit #1:
Which is more special to you and why?
A nice gesture when EXPECTED like your birthday, Valentine's Day, or an anniversary, or a nice gesture when UNEXPECTED.



4. Write the trigonometric function in the given graph in both formats

General Trigonometric Function

$f(x) = 0.75\cos\left(\frac{2}{5}x + 30\right)$

Translated Trigonometric Function

$f(x) = 0.75\cos\left(\frac{2}{5}(x + 50)\right)$

5. Complete the related table

A	B	C	D	Amplitude	Phase shift	Period Length	State implied period
0.75 (3/4)	2/5	20	0	3/4 = 0.75	50 left	900	[-50, 850)

6. Circle the related transformations

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

PL > 360

Show any related work here $PL = 850 - -50 = 900$ (PL = 900)

$B = \frac{360}{PL} = \frac{360}{900} = \frac{2}{5}$

$\frac{2}{5}(x + 50) = \frac{2}{5}x + \frac{100}{5} = \frac{2}{5}x + 20$

Extra Credit #2: Give an example of when you learned a lesson about the nature of friendships you have had in the past. Was this lesson a positive or negative experience?

$= 50$ $-VR$ & VC — Shift Right

PS $= \frac{-C}{B} = \frac{\frac{400}{8}}{\frac{8}{5}} = \frac{400}{8} \cdot \frac{5}{8} = \frac{400}{8}$ $f(x) = \frac{-5}{7}\cos\left(\frac{8}{5}x - 80\right)$

state the translated version of this trigonometric function $f(x) = \frac{-5}{7}\cos\left(\frac{8}{5}(x-50)\right)$

PL $= \frac{360}{B} = \frac{360}{\left(\frac{8}{5}\right)} = \frac{360}{1} \cdot \frac{5}{8} = \frac{1800}{8} = 225$ add stuff $\frac{225}{4} = 56.25$

A	B	C	D
$\frac{-5}{7}$	$\frac{8}{5}$	-80	0

State any extreme value points or intercepts in the IMPLIED period as POINTS when angles are measured in degrees

Label as Point K on graph below	Label as Point N on graph below	Label as point I on graph below	Label as point G on graph below	Label as point H on graph below
$(50, -\frac{5}{7})$	$(106.25, 0)$	$(162.5, \frac{5}{7})$	$(218.75, 0)$	$(275, -\frac{5}{7})$

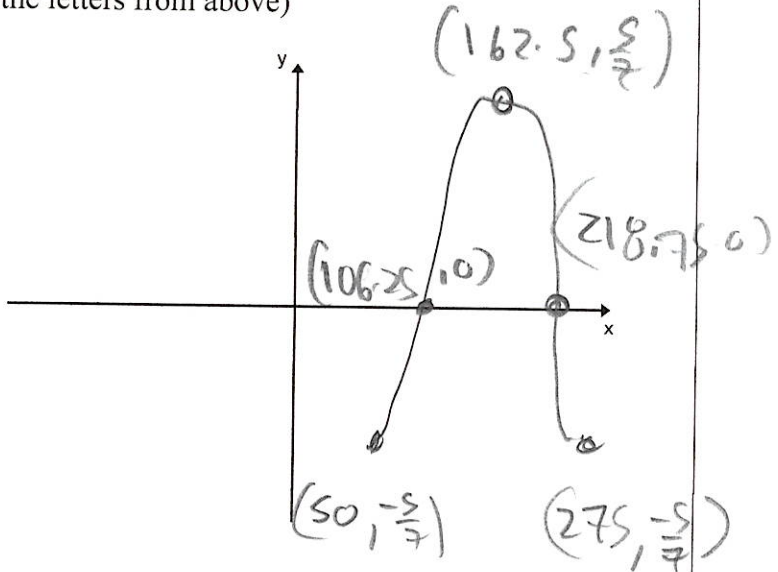
State each of these (these depend on A and D)

Range of the function	Midline of the function	Amplitude of the function
$[-\frac{5}{7}, \frac{5}{7}]$	$y = 0$	$\frac{5}{7}$

State each of these (these depend on B and C)

Length of ONE PERIOD of the function	Period that is IMPLIED by this function	PHASE Shift of this function (be certain to state direction and number)
225	$[50, 275)$	50 R

Sketch g(x) label the FIVE important points (use the letters from above)



Circle the related transformations

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp < 1 $A < 0$ $PL < 360$

amp $\frac{5}{7}$ $A = -\frac{5}{7}$ $PL = 225$

$$g(x) = \frac{-5}{6}\sin\left(\frac{4}{3}x - 96\right)$$

state the translated version of this trigonometric function $g(x) = \frac{-5}{6}\sin\left(\frac{4}{3}(x-72)\right)$

A	B	C	D
$-\frac{5}{6}$	$\frac{4}{3}$	-96	0

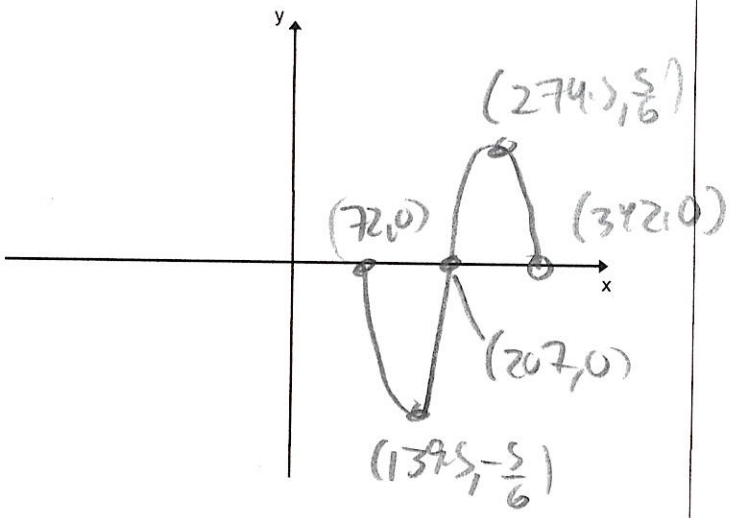
State any extreme value points or intercepts in the IMPLIED period as POINTS when angles are measured in degrees

Label as Point K on graph below	Label as Point N on graph below	Label as point I on graph below	Label as point G on graph below	Label as point H on graph below
(72, 0)	(1395, $-\frac{5}{6}$)	(207, 0)	(274.5, $\frac{5}{6}$)	(342, 0)

State each of these (these depend on A and D)

Range of the function	Midline of the function	Amplitude of the function
$[-\frac{5}{6}, \frac{5}{6}]$	$y = 0$	$\frac{5}{6}$

Sketch g(x) label the FIVE important points (use the letters from above)



State each of these (these depend on B and C)

Length of ONE PERIOD of the function	Period that is IMPLIED by this function	PHASE Shift of this function (be certain to state direction and number)
270	[72, 342)	72 R.

$PL = \frac{360}{B} = \frac{360}{\frac{4}{3}} = 360 \cdot \frac{3}{4} = \frac{1080}{4} = 270$

col shift $\frac{1}{4}$ PL $= \frac{1}{4}(270) = 67.5$

$PS = \frac{-C}{B}$ $\frac{96}{(\frac{4}{3})} = 96 \cdot \frac{3}{4} = \frac{288}{4} = 72$

Name_____

SA Transformations of Sine and Cosine
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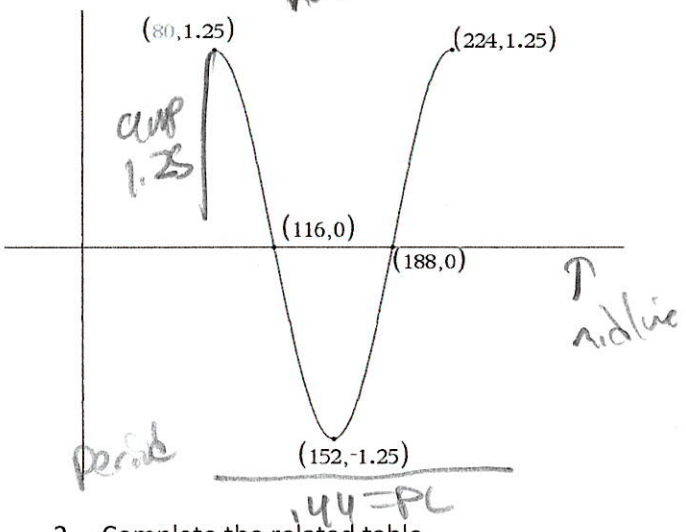
2nd hour	3rd hour	4th hour
5th hour	6th hour	7th hour

$PL = 224 - 80 = 144$

$B = \frac{360}{PL} = \frac{360}{144} = \frac{5}{2}$

Write the equation of the given trigonometric function, answer the related questions, and select the related transformations



1. Write the trigonometric function in the given graph in both formats

General Trigonometric Function

$f(x) = 1.25\cos\left(\frac{5}{2}x - 200\right)$

Translated Trigonometric Function

$f(x) = 1.25\cos\left(\frac{5}{2}(x - 80)\right)$

2. Complete the related table

A	B	C	D	Amplitude	Phase shift	Period Length	State implied period
1.25	$\frac{5}{2}$	-200	0	1.25	80R	144	$[80, 224)$

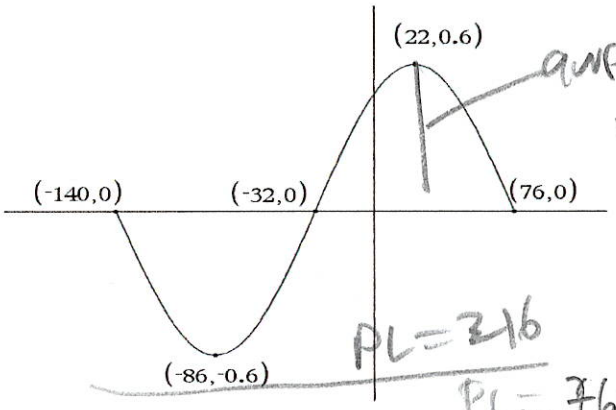
3. Circle the related transformations

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp > 1 $A > 1$ $PL < 360$ $PL = 144$

Show any related work here

Extra Credit #1:
Which is more special to you and why?
A nice gesture when EXPECTED like your birthday, Valentine's Day, or an anniversary, or a nice gesture when UNEXPECTED.



amp
VR!

PL=216

PL = 76 - 140 < 216

4. Write the trigonometric function in the given graph in both formats

General Trigonometric Function

$f(x) = 0.6\sin(-\frac{5}{3}x + \frac{700}{3})$

Translated Trigonometric Function

$f(x) = 0.6\sin(\frac{5}{3}(x + 140))$

amp = 0.6 - 0 = 0.6

5. Complete the related table

A	B	C	D	Amplitude	Phase shift	Period Length	State implied period
-0.6	$\frac{5}{3}$	$\frac{700}{3}$ 233.3	0	0.6	-140 Left	216	[-140, 76)

6. Circle the related transformations

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp < 1

Show any related work here

amp = 0.6

∩

PL < 360

PL = 216

$B = \frac{360}{PL} = \frac{360}{(216)} = \frac{5}{3}$

Extra Credit #2: Give an example of when you learned a lesson about the nature of friendships you have had in the past. Was this lesson a positive or negative experience?

$f(x) = \frac{7}{8}\sin\left(\frac{9}{5}x - 80\right)$

state the translated version of this trigonometric function $f(x) = \frac{7}{8}\sin\left(\frac{9}{5}\left(x - \frac{400}{9}\right)\right)$

$PS = \frac{-C}{B} = \frac{80}{\frac{9}{5}} = \frac{80}{1}\cdot\frac{5}{9} = \frac{400}{9}$ $PL = \frac{360}{B} = \frac{360}{\left(\frac{9}{5}\right)} = \frac{360}{1}\cdot\frac{5}{9}$

A	B	C	D
$\frac{7}{8}$	$\frac{9}{5}$	-80	0

$= 200$ and $\frac{200}{4} = 50 = \frac{450}{9}$

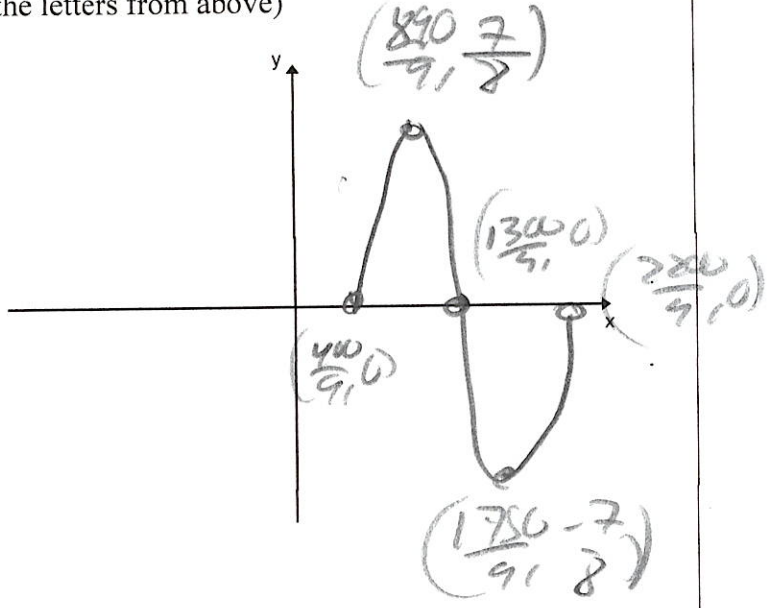
State any extreme value points or intercepts in the IMPLIED period as POINTS when angles are measured in degrees

Label as Point K on graph below	Label as Point N on graph below	Label as point I on graph below	Label as point G on graph below	Label as point H on graph below
$(44.4, 0)$	$(94.44, \frac{7}{8})$	$(144.44, 0)$	$(194.44, -\frac{7}{8})$	$(244.44, 0)$
$(\frac{400}{9}, 0)$	$(\frac{850}{9}, \frac{7}{8})$	$(\frac{1300}{9}, 0)$	$(\frac{1750}{9}, -\frac{7}{8})$	$(\frac{2200}{9}, 0)$

State each of these (these depend on A and D)

Range of the function	Midline of the function	Amplitude of the function
$[-\frac{7}{8}, \frac{7}{8}]$	$y = 0$	$\frac{7}{8}$

Sketch g(x) label the FIVE important points (use the letters from above)



State each of these (these depend on B and C)

Length of ONE PERIOD of the function	Period that is IMPLIED by this function	PHASE Shift of this function (be certain to state direction and number)
200	$[\frac{400}{9}, \frac{2200}{9}]$ $[44.\overline{4}, 244.4]$	$\frac{400}{9}$ $44.\overline{4}$ Right

Circle the related transformations

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp < 1

amp $\frac{7}{8}$

PL < 360

PL = 200

$$g(x) = \frac{5}{6}\cos\left(\frac{1}{4}x + 96\right)$$

state the translated version of this trigonometric function $g(x) = \frac{5}{6}\cos\left(\frac{1}{4}(x + 384)\right)$

$PS = \frac{-C}{B} = \frac{-96}{\left(\frac{1}{4}\right)} = -96 \cdot \frac{4}{1} = -384$

$PC = \frac{360}{\left(\frac{1}{4}\right)} = 360 \cdot 4 = 1440$

A	B	C	D
$\frac{5}{6}$	$\frac{1}{4}$	96	0

cool stuff $\frac{1440}{4} = 360$

State any extreme value points or intercepts in the IMPLIED period as POINTS when angles are measured in degrees

Label as Point K on graph below	Label as Point N on graph below	Label as point I on graph below	Label as point G on graph below	Label as point H on graph below
$(-384, \frac{5}{6})$	$(-24, 0)$	$(336, -\frac{5}{6})$	$(696, 0)$	$(1056, \frac{5}{6})$

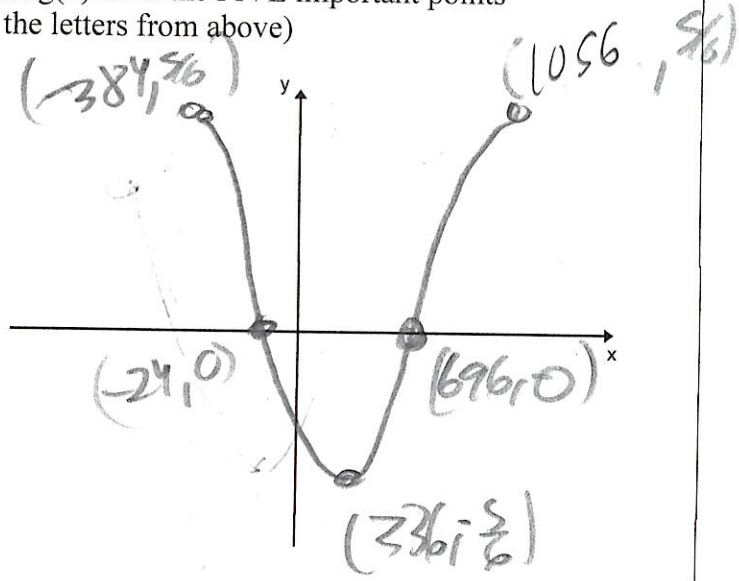
State each of these (these depend on A and D)

Range of the function	Midline of the function	Amplitude of the function
$[-\frac{5}{6}, \frac{5}{6}]$	$y = 0$	$\frac{5}{6}$

State each of these (these depend on B and C)

Length of ONE PERIOD of the function	Period that is IMPLIED by this function	PHASE Shift of this function (be certain to state direction and number)
1440	$[-384, 1056)$	-384 384 left

Sketch g(x) label the FIVE important points (use the letters from above)



Name_____

SA Transformations of Sine and Cosine
Writing a Function from its Graph
Graphing a Function from its Function

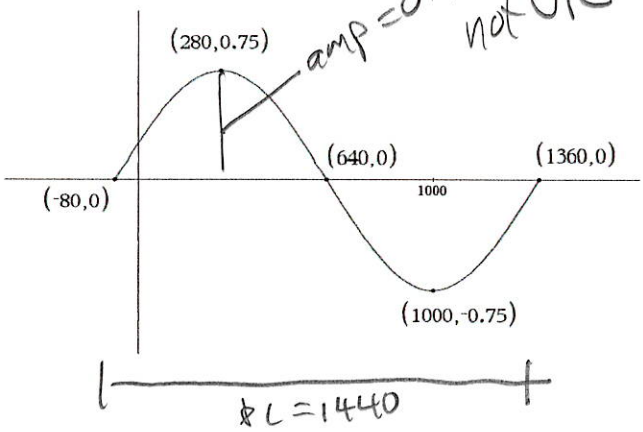
2nd hour	3rd hour	4th hour
5th hour	6th hour	7th hour

$B = \frac{360}{PL} = \frac{360}{1440} = \frac{1}{4}$

$PL = 1360 - -80 = 1440$

$PS = -80$

Write the equation of the given trigonometric function, answer the related questions, and select the related transformations



1. Write the trigonometric function in the given graph in both formats

General Trigonometric Function

$f(x) = 0.75\sin(\frac{1}{4}x + 20)$

Translated Trigonometric Function

$f(x) = 0.75\sin\frac{1}{4}(x + 80)$

2. Complete the related table

A	B	C	D	Amplitude	Phase shift	Period Length	State implied period
0.75	$\frac{1}{4}$	20	0	0.75	-80 Left 80	1440	

3. Circle the related transformations

amp = 0.75

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp < 1 A > 0 PL > 360 PL = 1440

Show any related work here

Extra Credit #1:
Which is more special to you and why?
A nice gesture when EXPECTED like your birthday, Valentine's Day, or an anniversary, or a nice gesture when UNEXPECTED.

$$g(x) = \frac{2}{5}\cos\left(\frac{5}{3}x + 90\right)$$

state the translated version of this trigonometric function $g(x) = \frac{2}{5}\cos\left(\frac{5}{3}(x + 54)\right)$

$PS = \frac{-C}{B} = \frac{-90}{\left(\frac{5}{3}\right)} = \frac{90}{1} \cdot \frac{3}{5} = \frac{270}{5} = -54$

A	B	C	D
2/5	5/3	90	0

$PL = \frac{360}{\left(\frac{5}{3}\right)} = \frac{360}{1} \cdot \frac{3}{5} = \frac{1080}{5} = 216$

State any extreme value points or intercepts in the IMPLIED period as POINTS when angles are measured in degrees

Label as Point K on graph below $(-54, \frac{2}{5})$

Label as Point N on graph below $(0, 0)$

Label as point I on graph below $(54, -\frac{2}{5})$

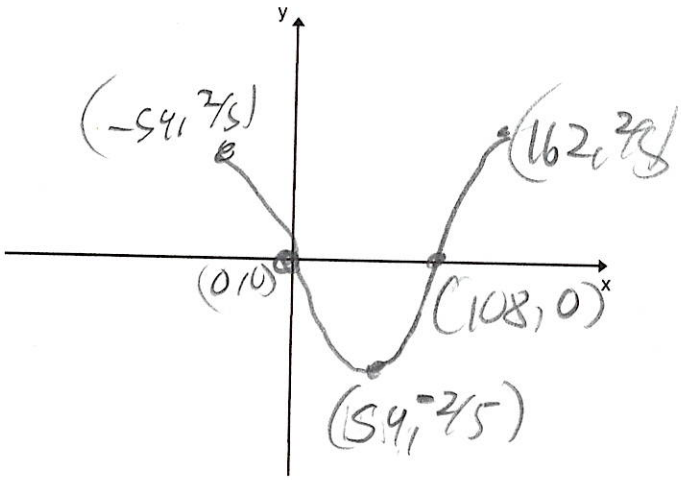
Label as point G on graph below $(108, 0)$

Label as point H on graph below $(162, 2/5)$

State each of these (these depend on A and D)

Range of the function	Midline of the function	Amplitude of the function
$[-\frac{2}{5}, \frac{2}{5}]$	$y = 0$	$\frac{2}{5}$

Sketch g(x) label the FIVE important points (use the letters from above)

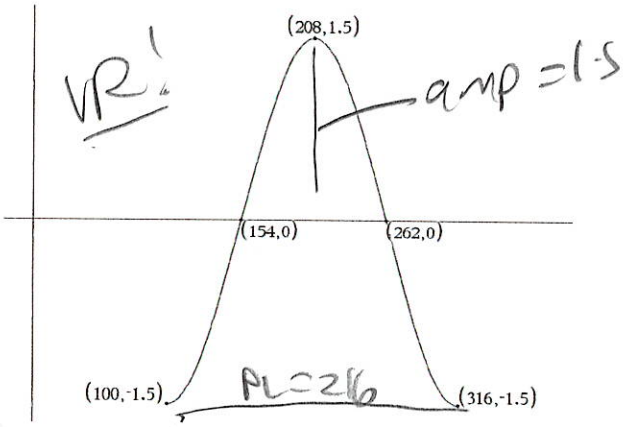


State each of these (these depend on B and C)

Length of ONE PERIOD of the function	Period that is IMPLIED by this function	PHASE Shift of this function (be certain to state direction and number)
216	$[-54,)$	-54 54 left

cool stuff

$\frac{216}{4} = 54$



4. Write the trigonometric function in the given graph in both formats

General Trigonometric Function

$f(x) = -1.5\cos\left(\frac{5}{3}x - \frac{500}{3}\right)$

Translated Trigonometric Function

$f(x) = -1.5\cos\left(\frac{5}{3}(x - 100)\right)$

5. Complete the related table

A	B	C	D	Amplitude	Phase shift	Period Length	State implied period
-1.5	$\frac{5}{3}$	$\frac{500}{3}$ $166.\overline{6}$	0	1.5	100 100 Right	216	[100, 316)

6. Circle the related transformations

amp 1.5

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp > 1

Show any related work here

$PL = 316 - 100 = 216$ (end − begin)

$B = \frac{360}{PL} = \frac{360}{216} = \frac{5}{3}$

PL < 360

PL = 216

Extra Credit #2: Give an example of when you learned a lesson about the nature of friendships you have had in the past. Was this lesson a positive or negative experience?

$$f(x) = -\frac{5}{3}\sin\left(\frac{8}{3}x - 72\right)$$

state the translated version of this trigonometric function $f(x) = \frac{-5}{3}\sin\left(\frac{8}{3}(x-27)\right)$

$PS = \frac{-C}{B} = \frac{72}{\left(\frac{8}{3}\right)} = \frac{72}{1}\cdot\frac{3}{8} = \frac{216}{8} = 27$

$PL = \frac{360}{\left(\frac{8}{3}\right)} = \frac{360}{B}$

$= \frac{360}{1}\cdot\frac{3}{8} = \frac{1080}{8} = 135$

A	B	C	D
$-\frac{5}{3}$	$\frac{8}{3}$	-72	0

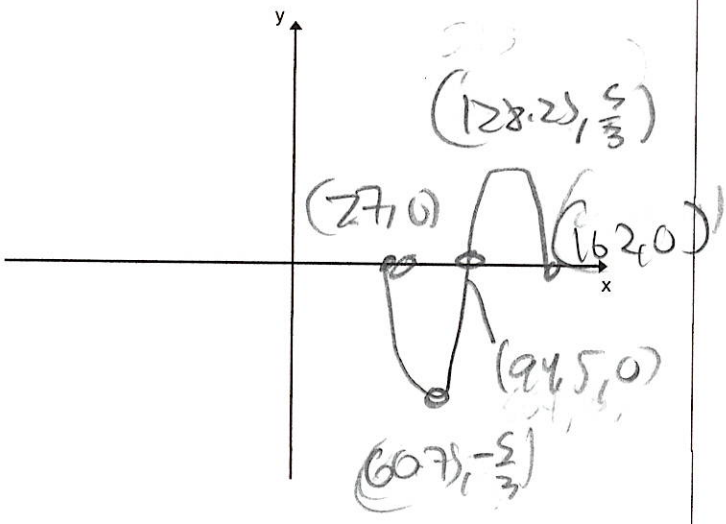
State any extreme value points or intercepts in the IMPLIED period as POINTS when angles are measured in degrees

Label as Point K on graph below	Label as Point N on graph below	Label as point I on graph below	Label as point G on graph below	Label as point H on graph below
$(27, 0)$	$(\frac{243}{11}, -\frac{5}{3})$	$(\frac{189}{2}, 0)$	$(\frac{513}{4}, \frac{5}{3})$	$(162, 0)$

State each of these (these depend on A and D)

Range of the function	Midline of the function	Amplitude of the function
$[-\frac{5}{3}, \frac{5}{3}]$	$y=0$	$\frac{5}{3}$

Sketch g(x) label the FIVE important points (use the letters from above)



State each of these (these depend on B and C)

Length of ONE PERIOD of the function	Period that is IMPLIED by this function	PHASE Shift of this function (be certain to state direction and number)
135	$[27, 162)$	27 Rish

cool stuff $\frac{1}{4}PL = \frac{1}{4}(135) = 33.75$

Circle the related transformations

Vertical Compression	Vertical Stretch	Vertical Reflection	Horizontal Compression	Horizontal Stretch	Phase Shift LEFT	Phase Shift RIGHT

amp > 1 $A < D$ $PL < 360$

amp $\frac{5}{3}$ $A = -\frac{5}{3}$ $PL = 135$