Fitting the Data - Transforming y = sin(x) & y = cos(x) | Lesson 32

(A) Lesson Objectives

a. Review Function Composition and its relationship to Transforming Parent Functions
b. Review graphing f(x) = sin(x) and f(x) = cos(x) and the features of these parent functions
c. Explore the effect of A & D in the equation f(x) = Asin(x) + D & f(x) =Acos(x) + D
d. Explore the effect of k & C in the equation f(x) = sin k(x + C) and f(x) = cos k(x + C)
e. Write equations from graphs & sketch graphs from equations

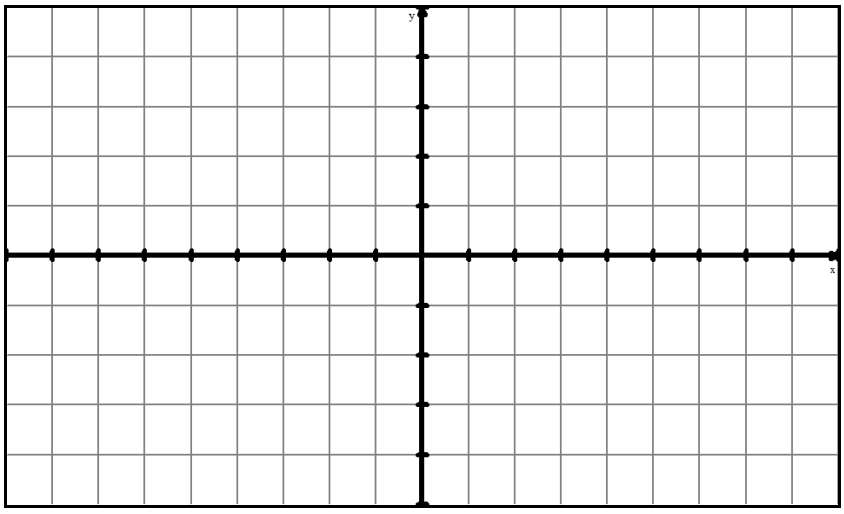
(B) Review of Composition – Setting the Stage for Making Predictions

If f(x) = x+3 and g(x) = x^2	(i) write equation for f o $g(x)$	(ii) Describe how g(x) is transformed by this composition
If f(x) = x + 3 and g(x) = x^2	(i) write equation for g o $f(x)$	(ii) Describe how g(x) is transformed by this composition
If f(x) = 3x and g(x) = x^2	(i) write equation for f o $g(x)$	(ii) Describe how g(x) is transformed by this composition

(C) Changing A & D in the Equation y = Asin(x) + D

If f(x) = x+3 and g(x) = sin(x), write the eqn for f o $g(x)$	PREDICT how g(x) is transformed by this composition

SKETCH 2 periods of f o $g(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84



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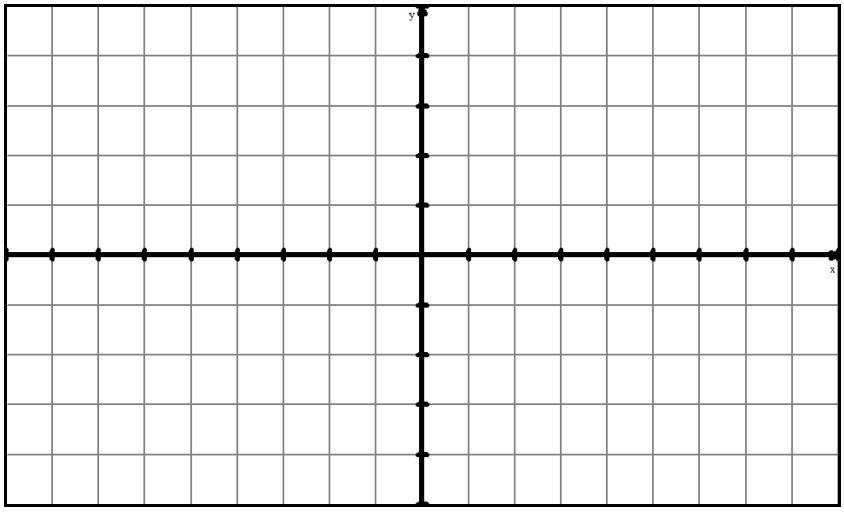
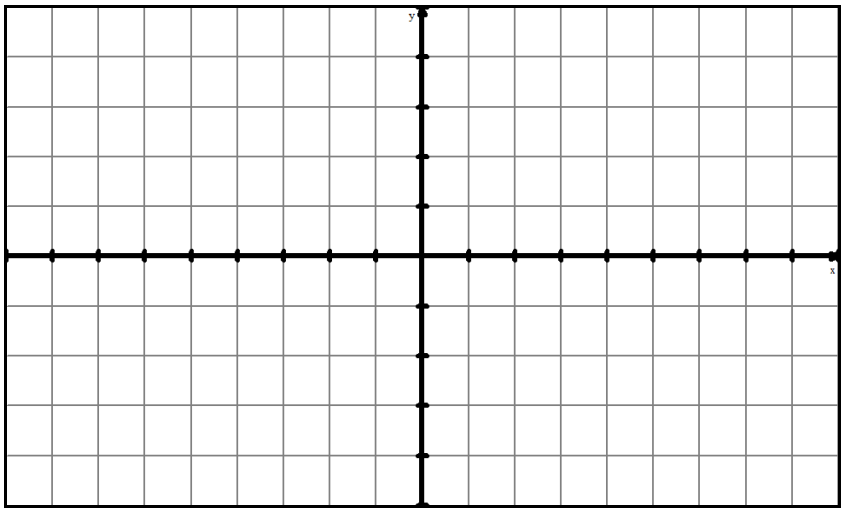
If f(x) = 3x and g(x) = sin(x), write the eqn for $f \circ g(x)$	PREDICT how g(x) is transformed by this composition

SKETCH 2 periods of $f \circ g(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84



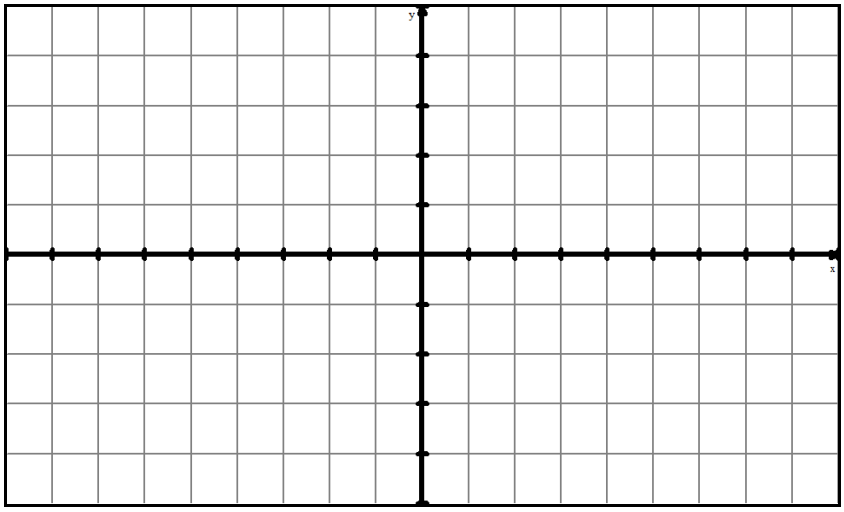
If f(x) = x – 2 and g(x) = cos(x), write the eqn for $f \circ g(x)$	PREDICT how g(x) is transformed by this composition

SKETCH 2 periods of $f \circ g(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84



If f(x) = ½x and g(x) = cos(x), write the eqn for f o $g(x)$	PREDICT how g(x) is transformed by this composition

SKETCH 2 periods of f o $g(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84

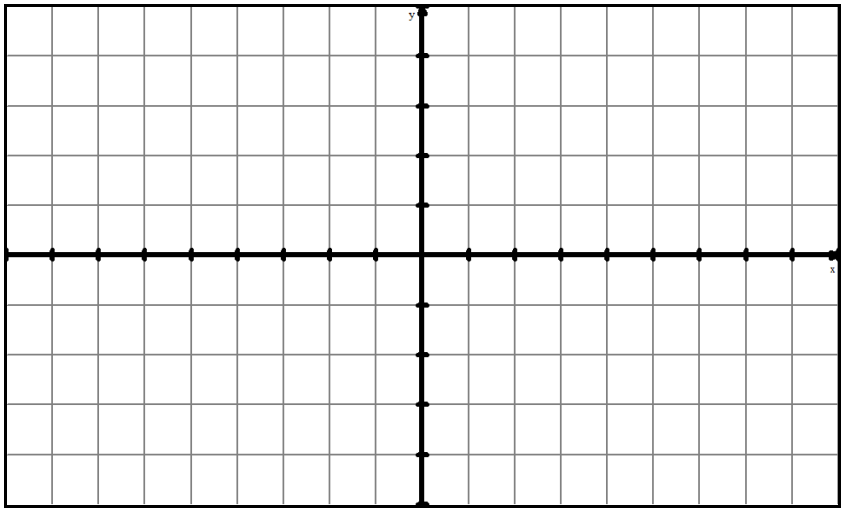


(D) General Conclusions about the Effect of Changing A and D:

(E) Changing k & C in the Equation y = sin k(x + C)

If f(x) = x+45 and g(x) = sin(x), write the eqn for g o $f(x)$	PREDICT how g(x) is transformed by this composition

SKETCH 2 periods of g o $f(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84



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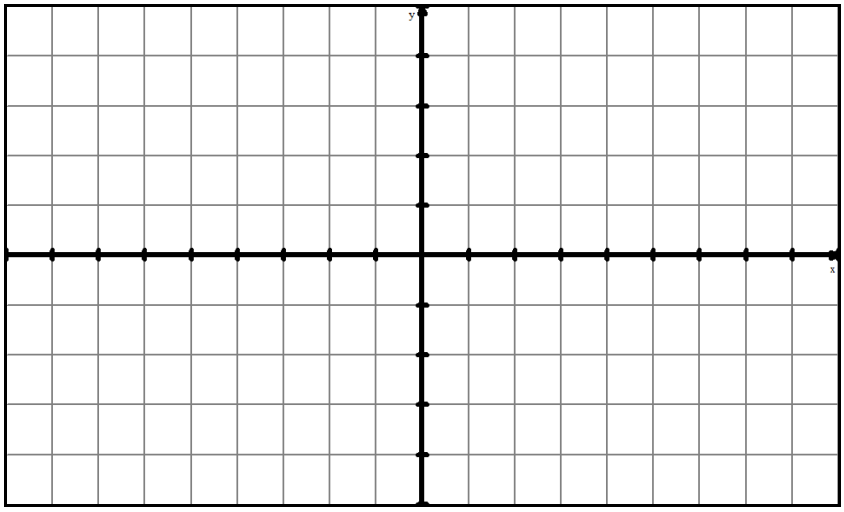
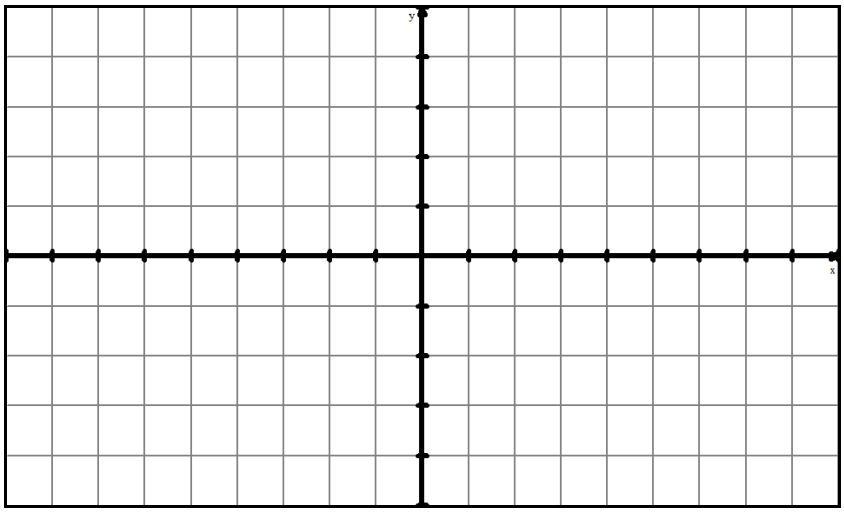
If f(x) = 2x and g(x) = sin(x), write the eqn for g o $f(x)$	PREDICT how g(x) is transformed by this composition

SKETCH 2 periods of g o $f(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84



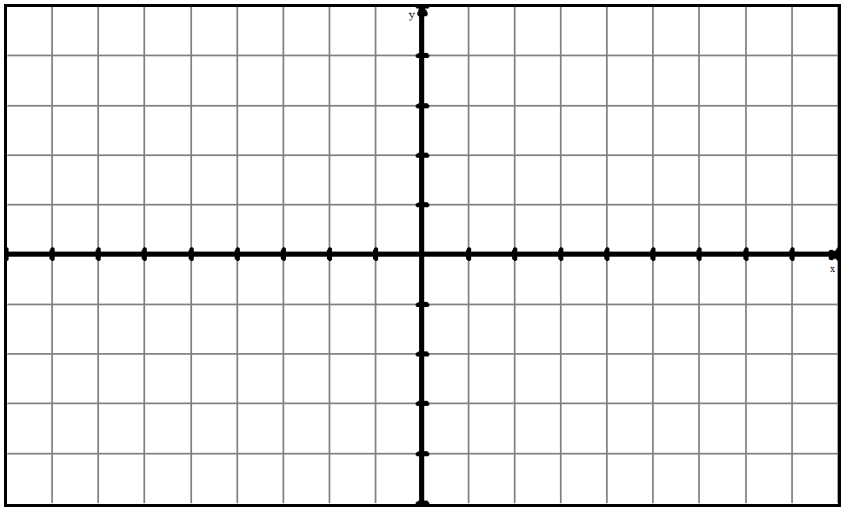
If f(x) = x – 90 and g(x) = cos(x), write the eqn for g o $f(x)$	PREDICT how g(x) is transformed by this composition

SKETCH 2 periods of g o $f(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84



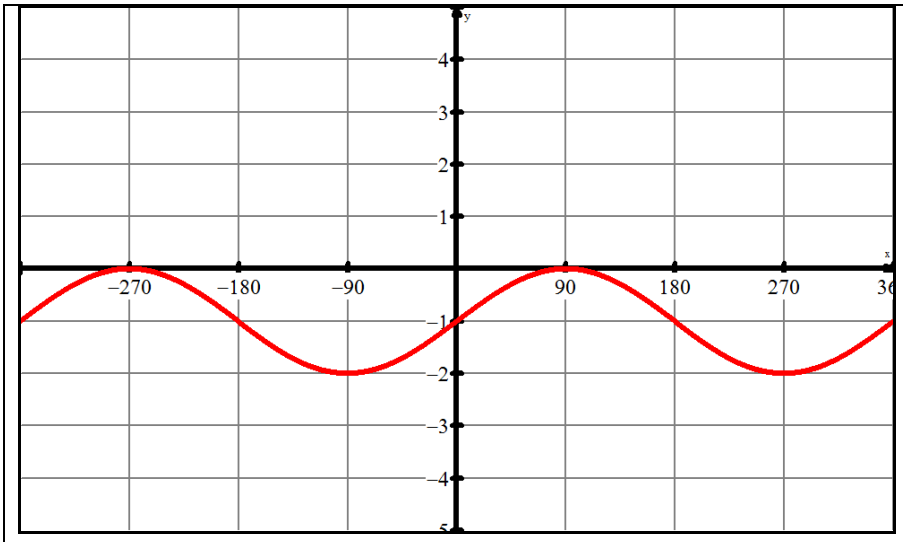
If f(x) = ½x and g(x) = cos(x), write the eqn for $g \circ f(x)$	PREDICT how g(x) is transformed by this composition

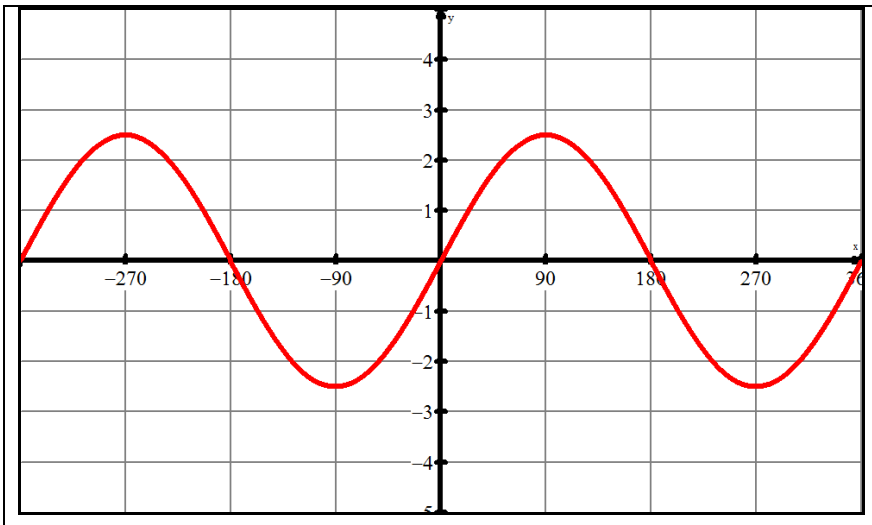
SKETCH 2 periods of $g \circ f(x)$ and analyze for (i) period, (ii) amplitude, (iii) axis of the curve. VERIFY on TI-84



(F) General Conclusions about the Effect of Changing A and D:

(G) Practice – From Graph to Equation

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270
−1
−2
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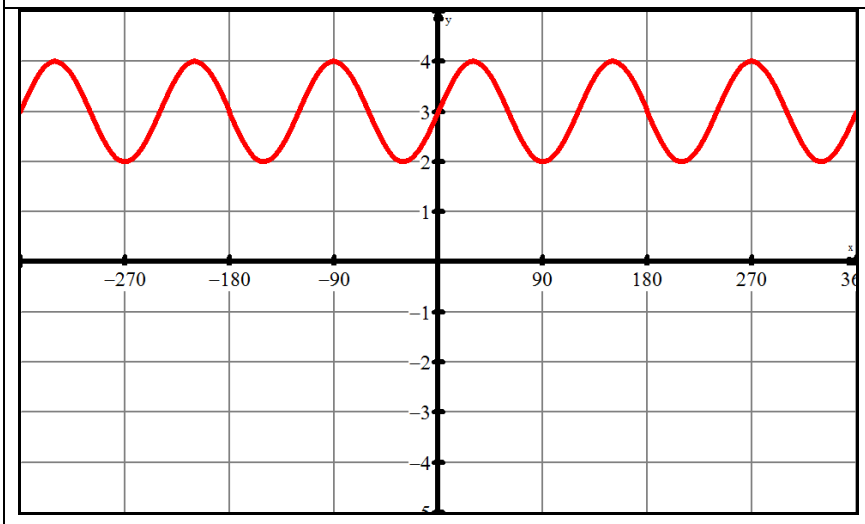
y
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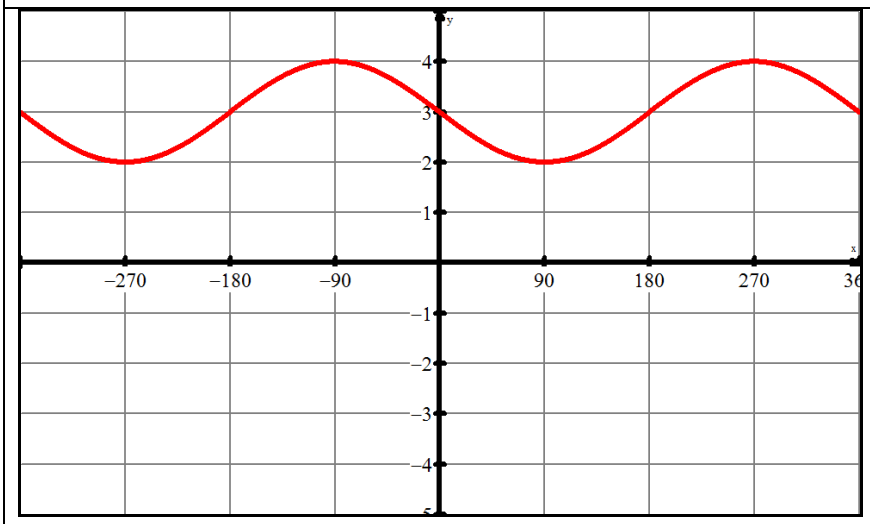
y
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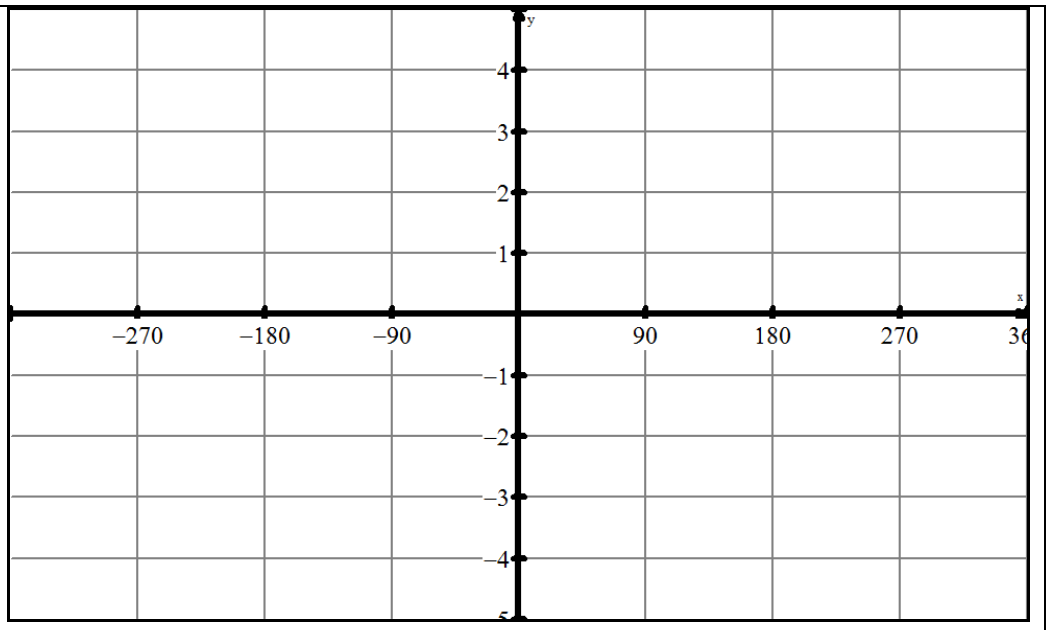
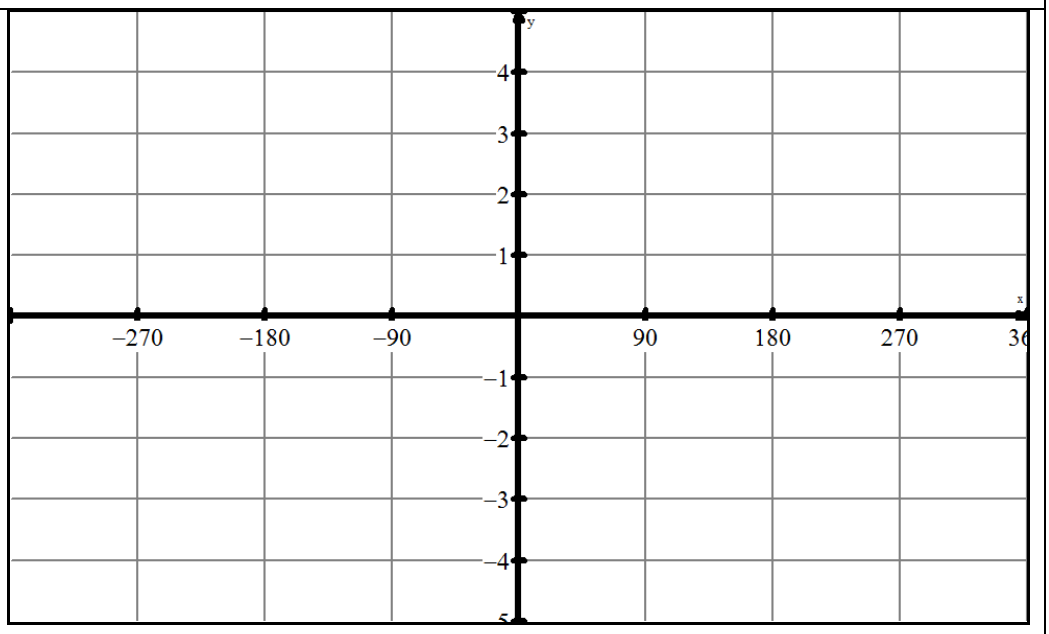
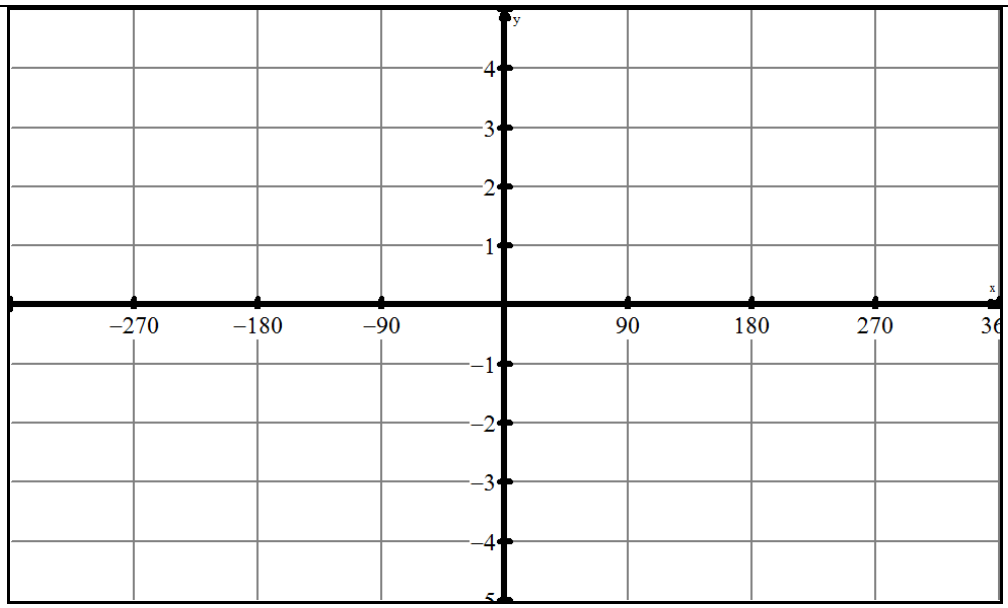
(H) Practice – From Equation to Graph – NO CALCULATOR

f(x) = 3 sin(x) – 1	
g(x) = 3cos(2x)	

f(x) = sin(x + 45) - 2	
g(x) = ½ cos(x – 90)