

MHF 4UI UNIT 5

Trigonometric Functions

Day 7
Change of Variable

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Often when dealing with word problems we want to use a variable on the x axis other than x or t . When using a variable like u for example all of the same Transformation principles apply.

$$y = a \sin k(x - p) + q$$

a = amplitude
 $k = \frac{2\pi}{\text{period}}$
 p = horizontal shift
 q = vertical shift

Example 1: State the period, amplitude, phase shift, and vertical displacement for each of the following functions:

a) $y = -3 \sin \frac{2\pi(t-3)}{7} + 1$

Period:

Amplitude:

Phase Shift:

Vertical Displacement:

b) $y = 4 \cos \frac{2\pi(t+5)}{4} - 6$

Period:

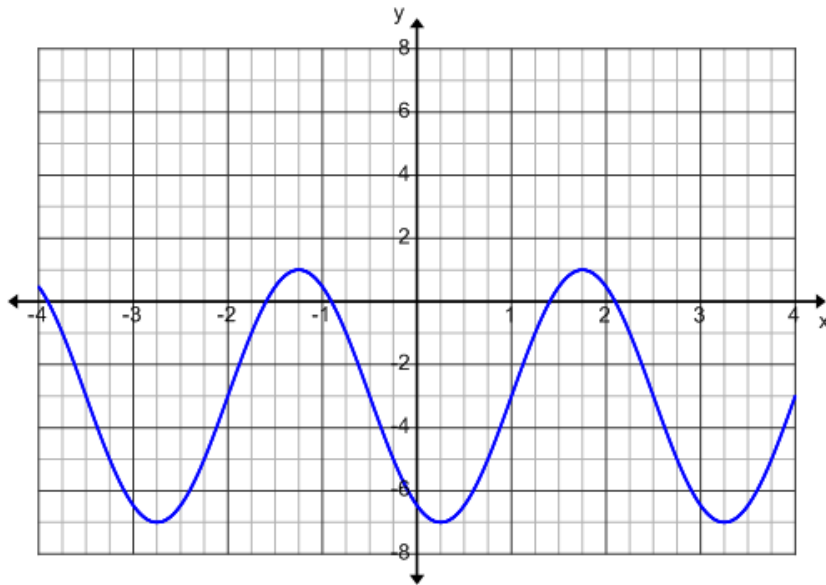
Amplitude:

Phase Shift:

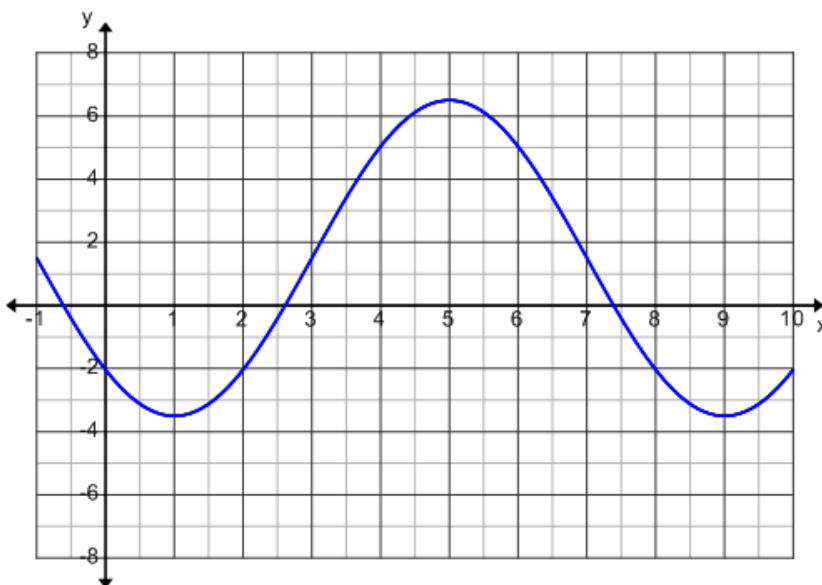
Vertical Displacement:

Example 2: For each of the following graphs , determine the period, amplitude, phase shift and vertical displacement. Then write an equation to model the graph.

a)

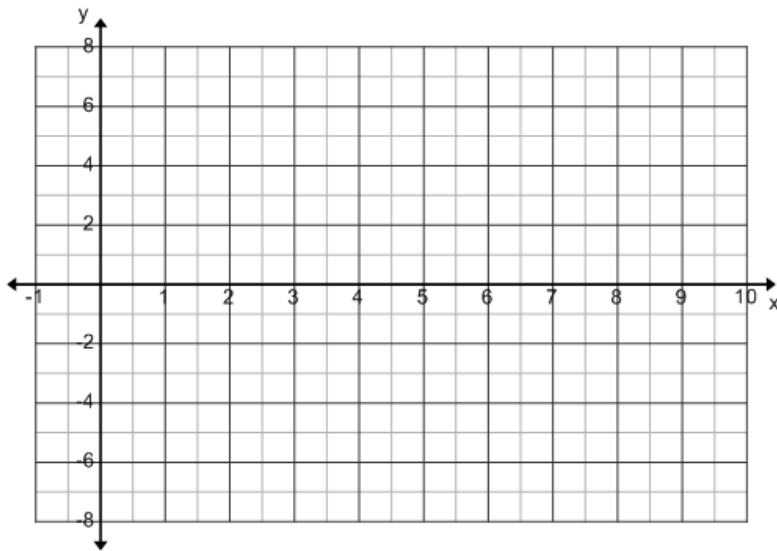


b)



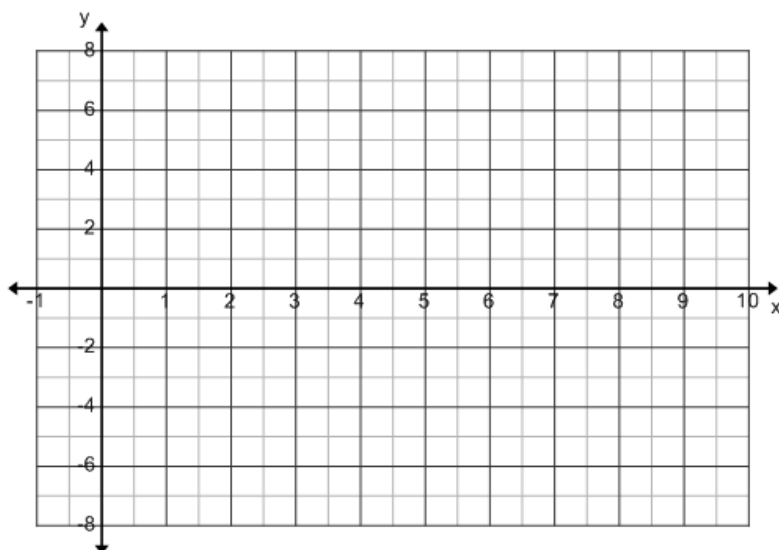
Example 3: Graph one complete cycle of the following curves:

a) $y = 4 \cos \frac{2\pi(x+2)}{7} - 3$



Pull

b) $y = -2 \sin \frac{2\pi(t-4)}{3} + 1$



Pull