

Trig Graphs: Varying Vertical Displacement and Amplitude

Complete handout investigation of VD and Amp

translation

Vertical Displacement: A vertical translation of our graph up or down

+ d: our graph moves up

- d: our graph moves down

What is the vertical displacement of each of the following graphs?

a) $y = 3 \sin \theta + 7$

b) $y = 2 \cos \theta - 5$

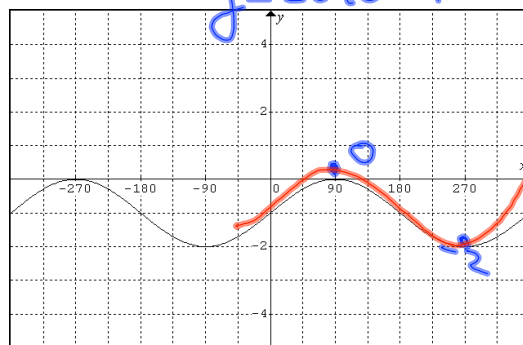
*translated up
7 units*

5 units down

Sometimes you are only given a graph and not an equation. To determine the vertical displacement from a graph we use the following formula:

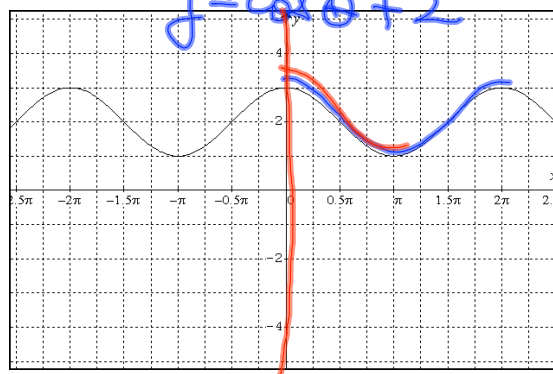
$$VD = \frac{Max + Min}{2}$$

Determine the equation of each of the following graphs



$$VD = \frac{0 + (-2)}{2}$$

$$VD = -1$$



$$VD = \frac{3 + 1}{2}$$

$$VD = 2$$

Amplitude: A vertical expansion or compression of our graph by a factor of "a"

- a > 1 vertical expansion
- 0 < a < 1 vertical compression
- a < 1 reflection in the x - axis

What is the amplitude of each of the following graphs?

a) $y = \underline{3} \sin\theta + 7$

b) $y = \underline{2} \cos\theta - 5$

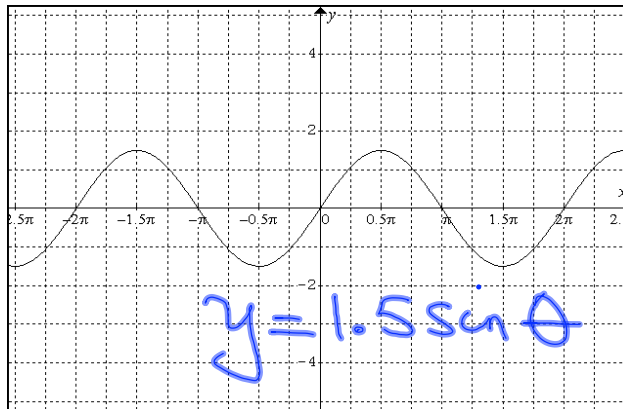
$a = 3$

$a = 2$

Sometimes you are only given a graph and not an equation. To determine the amplitude from a graph we use the following formula:

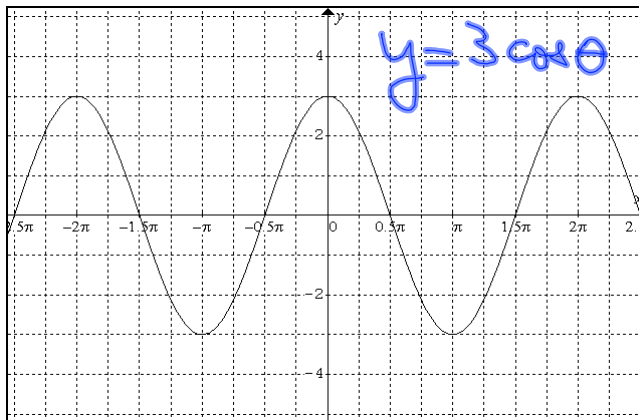
$$Amp = \frac{Max - Min}{2}$$

Determine the equation of each of the following graphs



$$Amp = \frac{1.5 - (-1.5)}{2}$$

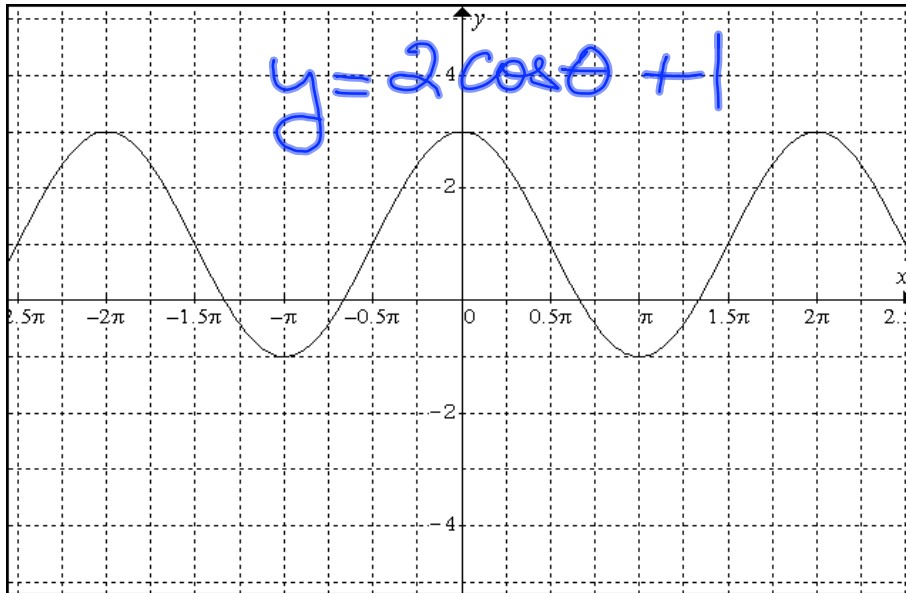
$$Amp = 1.5$$



$$Amp = \frac{3 - (-3)}{2}$$

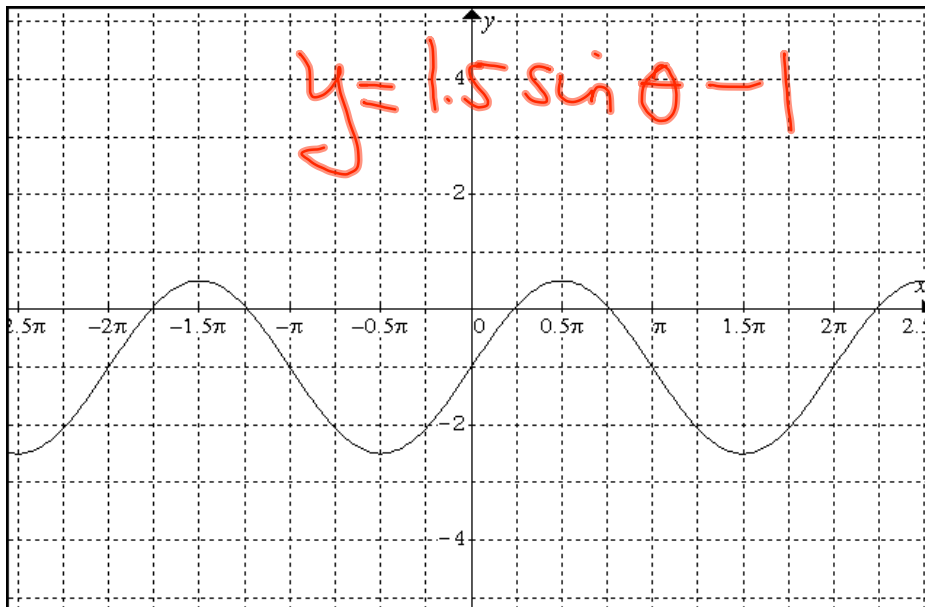
$$Amp = 3$$

Now let's try the equation of these graphs!!!!



$$\text{Amp} = \frac{3 - (-1)}{2} = 2$$

$$VD = \frac{3 + (-1)}{2} = 1$$



$$\text{Amp} = \frac{0.5 - (-2.5)}{2} = 1.5$$

$$VD = \frac{0.5 + (-2.5)}{2} = -1$$