

### 5.3 Varying Vertical Displacement and Amplitude

Complete handout investigation of VD and Amp

<http://www.ronblond.com/TK>

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

up 7

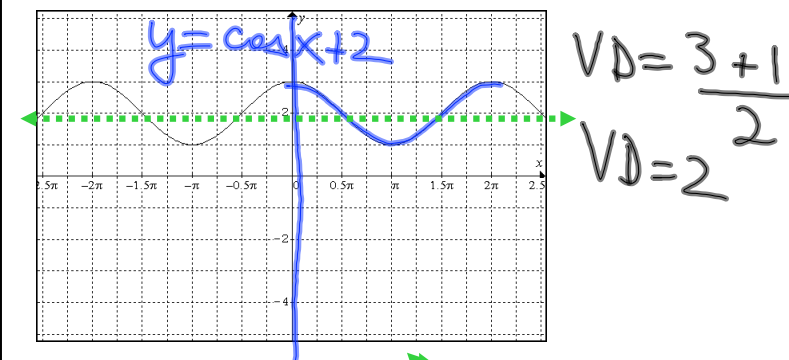
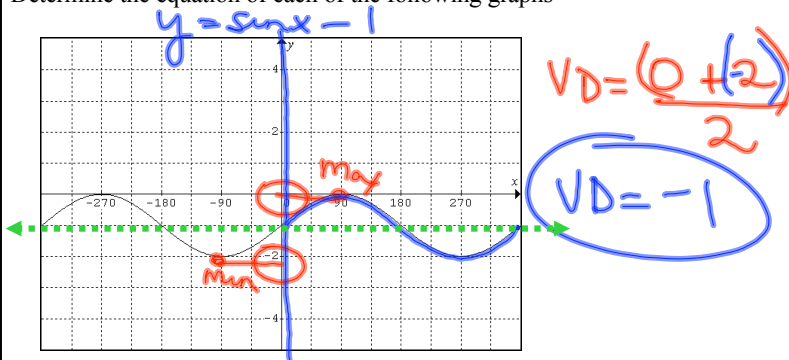
b)  $y = 2 \cos \theta - 5$

down 5

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 = Mean value

**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?

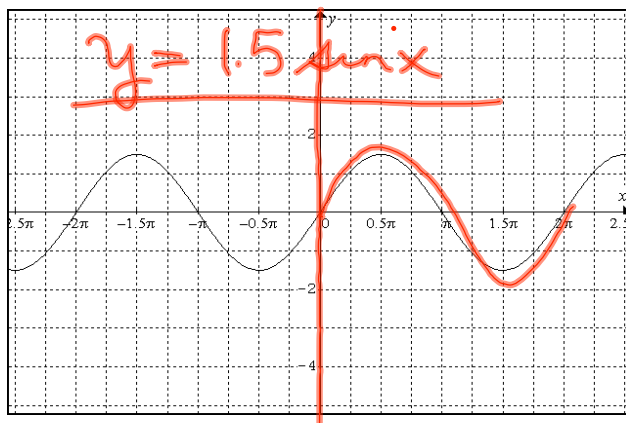
a)  $y = 3 \sin \theta + 7$

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

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

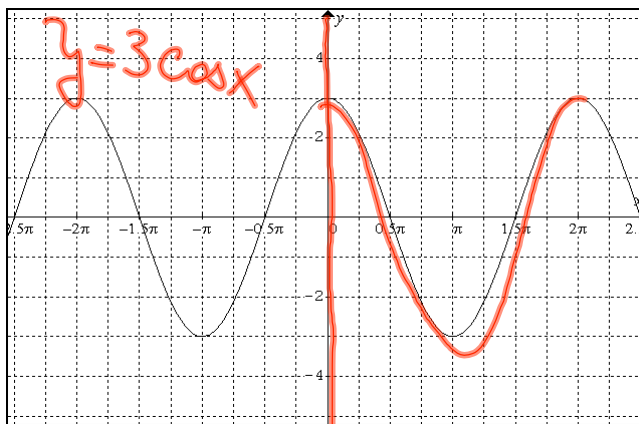
$$\text{Amp} = \frac{\text{Max} - \text{Min}}{2}$$

Determine the equation of each of the following graphs



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

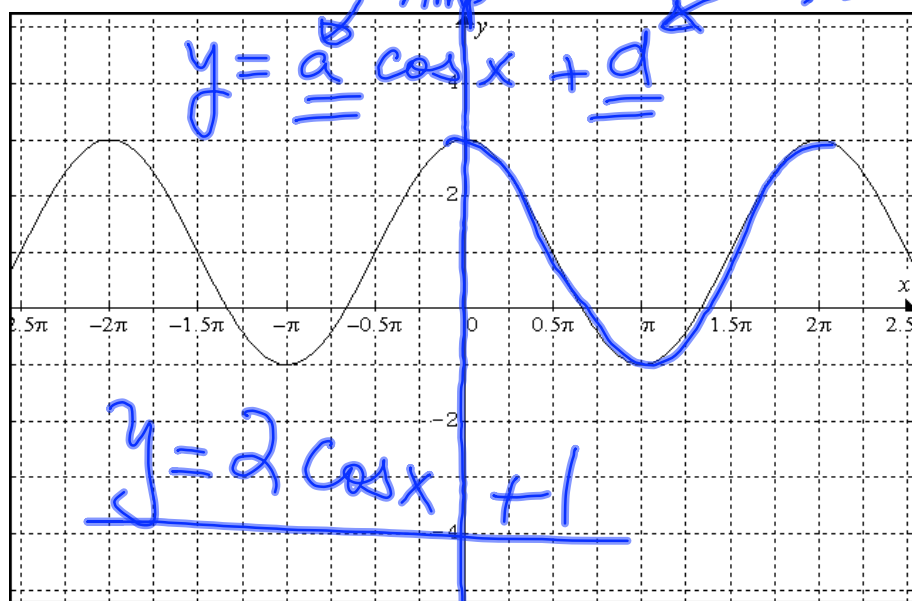
$A = 1.5$



$$\frac{3 + (-3)}{2}$$

$A = 3$

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

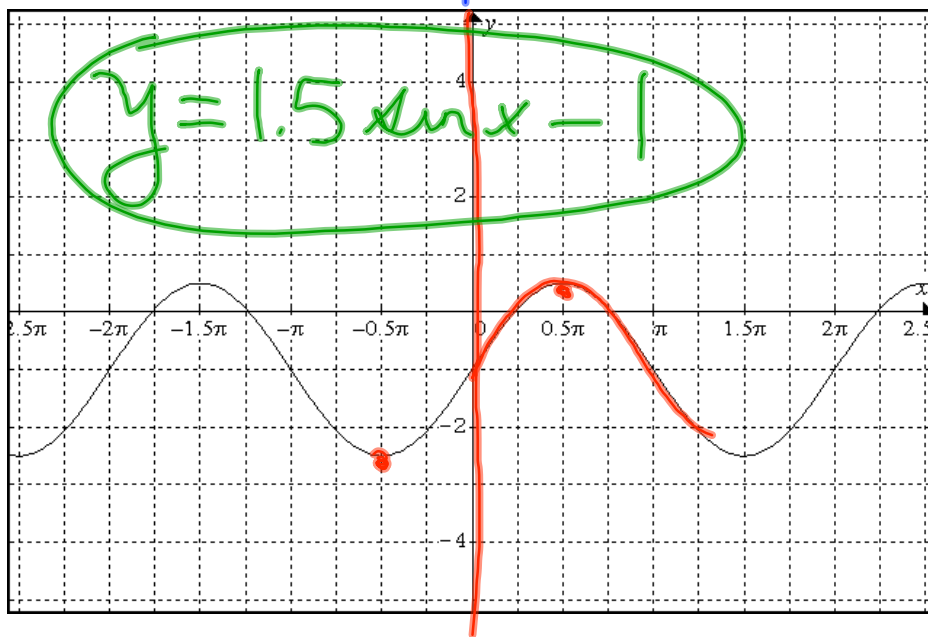


$$\text{Amp} = \frac{3 - (-1)}{2}$$

(2)

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

(VD = 1)



$$A = \frac{0.5 - (-2.5)}{2}$$

(A = 1.5)

$$\text{VP} = \frac{0.5 + (-2.5)}{2}$$

(VD = -1)

Assignment: Handout