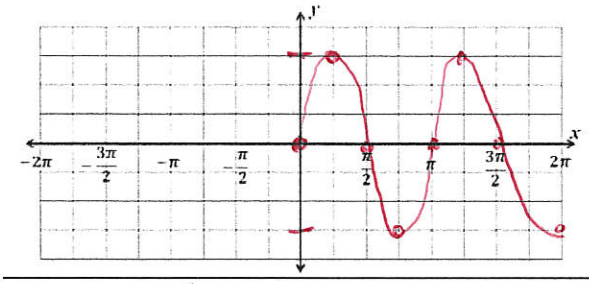
10.1 Graphing Sine and Cosine

Write your questions and thoughts here!

1. $f(\theta) = 3\sin 2\theta$

Amp: 3 Period: π Freq: 2

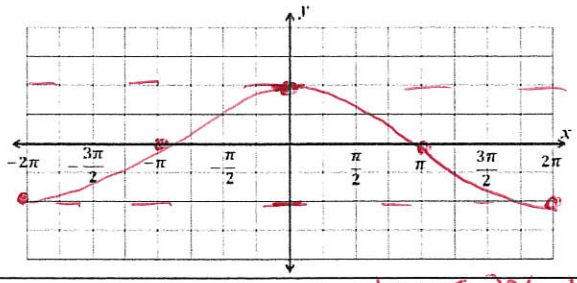
incr = $\pi/4$



2. $g(\theta) = -2\cos\frac{1}{2}\theta$ $2\pi \div \frac{1}{2}$

Amp: 2 Period: 4π Freq: $\frac{1}{2}$

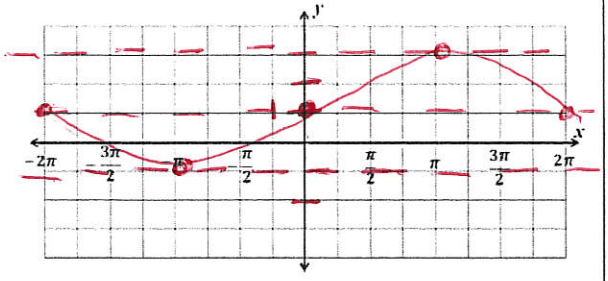
incr. = π



3. $y = 2\sin\frac{1}{2}x + 1$

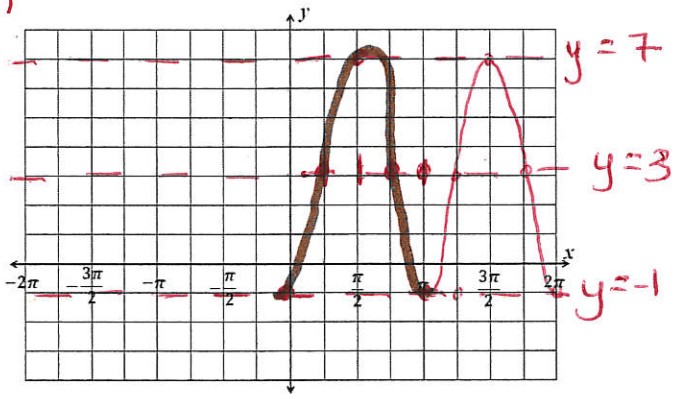
Amp: 2 Period: 4π Freq: $\frac{1}{2}$

incr = π (ctr wave)



4. $y = 3 - 4\cos 2x$ $= -4\cos 2x + 3$

Amp: 4 Period: π Freq: $b = 2$



Use the given information to create a *sine* function.

5.

Amplitude: 5

Period: 4π $= \frac{2\pi}{b}$ $b = \frac{1}{2}$

Vertical Shift: down 4

$y = 5\sin\left(\frac{1}{2}x\right) - 4$

6.

Amplitude: 3

Period: $\frac{2}{3}$ $= \frac{2\pi}{b}$ $2b = 6\pi$ $b = 3\pi$

Vertical Shift: up 1

$y = 3\sin(3\pi x) + 1$

7. Write a **cosine** function of the graph.

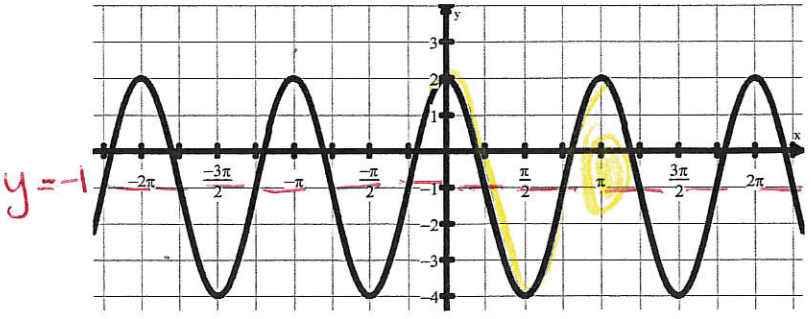
per = $\pi = \frac{2\pi}{b}$

$\pi b = 2\pi$

$b = 2$

$a = 3$

$d = -1$

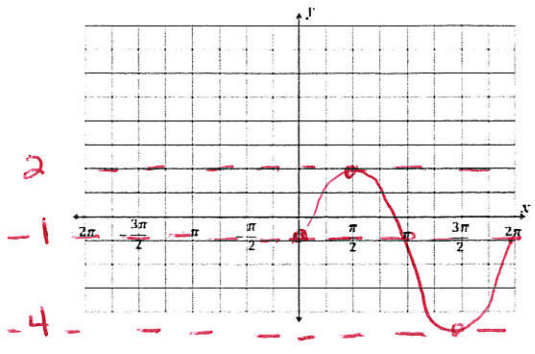


$y = 3\cos(2x) - 1$

Now summarize what you learned!

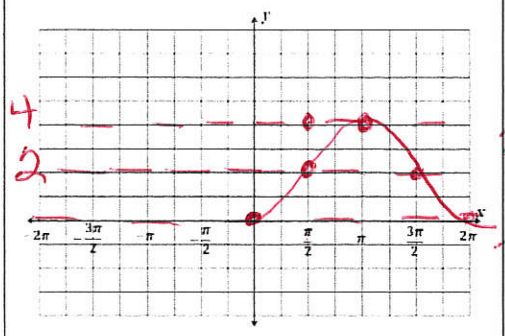
13. $f(\theta) = 3\sin\theta - 1$

Amp: 3 Period: 2π Freq: 1



14. $f(t) = -\cos t + 2$

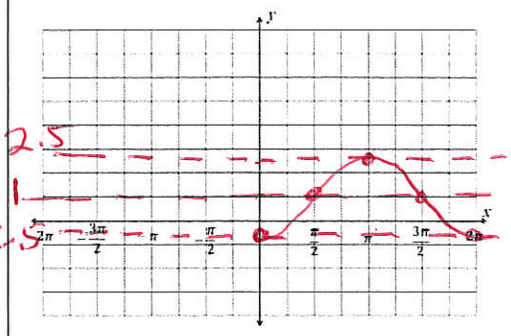
Amp: 1 Period: 2π Freq:



15. $y = 1 - \frac{3}{2}\cos x$

Amp: $\frac{3}{2}$ Period: 2π Freq: $b=1$

$d=1$

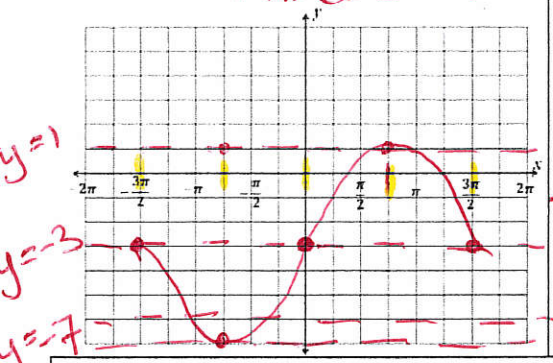


16. $y = -3 + 4\sin\frac{2}{3}x$

Amp: 4 Period: $2\pi \div \frac{2}{3}$ Freq: $\frac{2}{3}$

3π

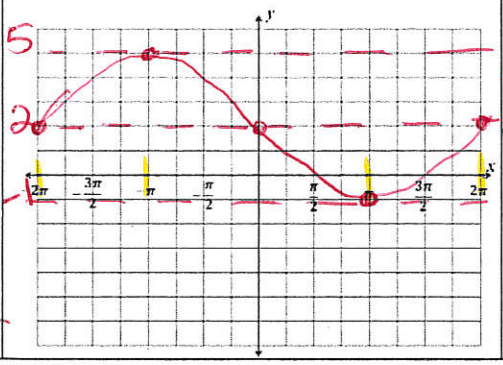
incr $= 3\pi/4$



17. $f(\theta) = 2 - 3\sin\frac{1}{2}\theta$

Amp: 3 Period: 4π Freq:

↓ 1st up 2

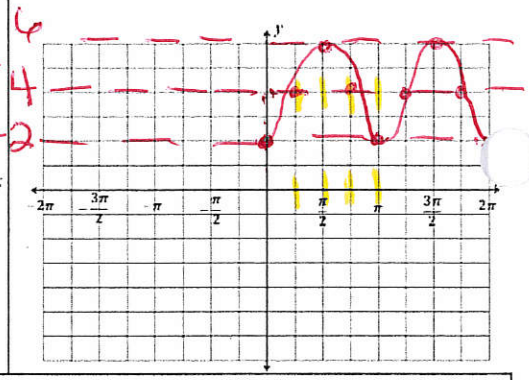


18. $f(t) = -2\cos 2t + 4$

Amp: 2 Period: Freq: $b=2$

per $= \pi$

up 4 incr $= \pi/4$



For 19 – 24, use the given information to create a *sine* function.

19.

Amplitude: 5

Period: 4π $= \frac{2\pi}{b}$ $4\pi b = 2\pi$ $b = 1/2$

Vertical Shift: down 4

$y = \pm 5\sin\left(\frac{1}{2}x\right) - 4$

20.

Amplitude: 2

Period: $\frac{3\pi}{5}$ $= \frac{2\pi}{b}$ $3\pi b = 10\pi$ $b = 10/3$

Vertical Shift: up 9

$y = \pm 2\sin\left(\frac{10}{3}x\right) + 9$

21.

Amplitude: 1

Period: 4 $= 2\pi/b$ $4b = 2\pi$ $b = \pi/2$

Vertical Shift: up 1

$y = \pm \sin\left(\frac{\pi}{2}x\right) + 1$

22.

Amplitude: 6

Period: 3π $= 2\pi/b$ $3\pi b = 2\pi$ $b = 2/3$

Vertical Shift: down 5

$y = \pm 6\sin\left(\frac{2}{3}\pi\right) - 5$

23.

Amplitude: $\frac{1}{5}$

Period: $\frac{\pi}{10}$ $= \frac{2\pi}{b}$ $20\pi = \pi b$ $20 = b$

Vertical Shift: up 15

$y = \pm \frac{1}{5}\sin(20x) + 15$

24.

Amplitude: 10

Period: $\frac{5}{6}$ $= \frac{2\pi}{b}$ $5b = 12\pi$ $b = 12\pi/5$

Vertical Shift: down 3

$y = \pm 10\sin\left(\frac{12\pi}{5}x\right) - 3$