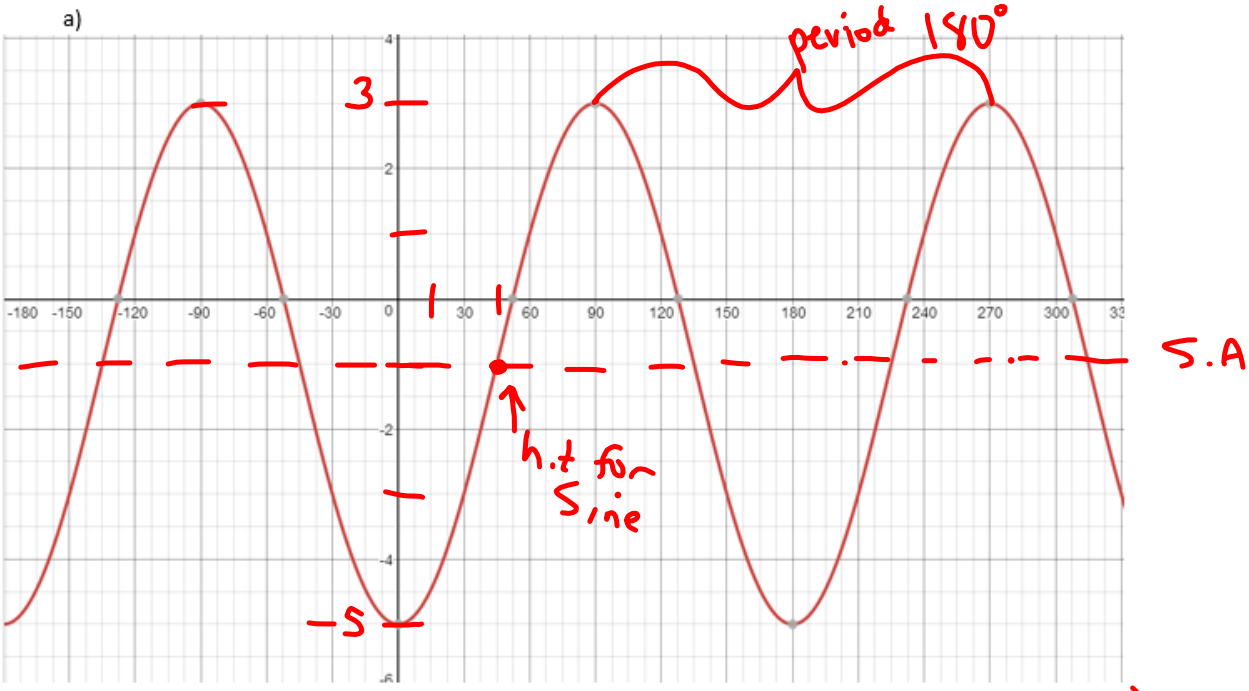
Math 3200 Practice of Sinusoidal graphs

1. For each of the following, determine the equation for Cosine AND Sine

a)



S.A ⇒ $\frac{-5+3}{2} = \frac{-2}{2} = -1$ (v.t)

amp ⇒ 4 (amp)

period ⇒ $\frac{180}{360} = \frac{1}{2}$ (h.s)

cosine (max) H.T
(-90, 90, 270

$y = 4\cos 2(x - 90°) - 1$

sine (S.A)
45°

$y = -4\cos 2(x - 180°) - 1$

$y = 4\sin 2(x - 45) - 1$

b)

$S.A \Rightarrow \frac{-3+9}{2} = \frac{6}{2} = 3$

amp = 6

h.t (cos) 135°

h.t (sine) 45° (reflection)

period : 360° ÷ 3

$\Rightarrow 120°$

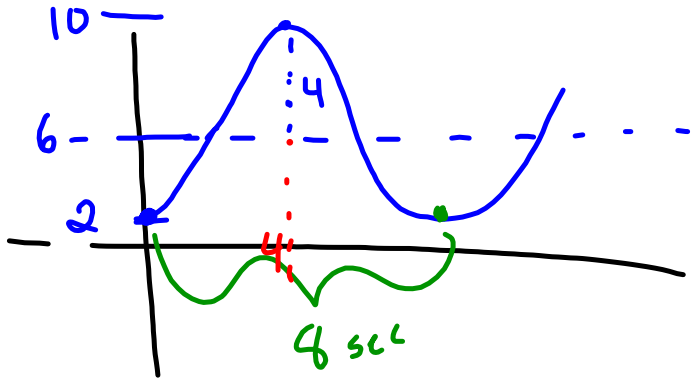
$y = 6\cos 3(x - 135°) + 3$

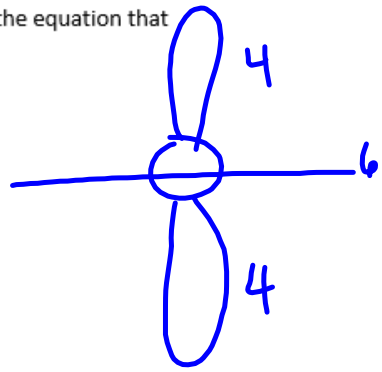
$y = -6\sin 3(x - 45) + 3$

$\frac{120}{360} = \frac{1}{3}$ (h.s)

2. Story Problems: Create a sinusoidal equation **Note: always easier to choose Cosine

a) A windmill consists of blades that are 4 m in length with its centre axle located 6m above ground level. It takes 8 seconds for the windmill to make one complete revolution. If you begin observing one of the blades when its tip is closest to the ground, determine the equation that describes its height in terms of time.





period = 8 sec

S.A ⇒ 6

Amp ⇒ 4

period ⇒ $\frac{8}{360} = \frac{1}{45}$

cos(h.t) ⇒ 4

$y = 4\cos 45(x-4)+6$

or

$y = -4\cos 45(x)+6$

$y = 4\cos 45(x-12)+6$

4 + 8 → period