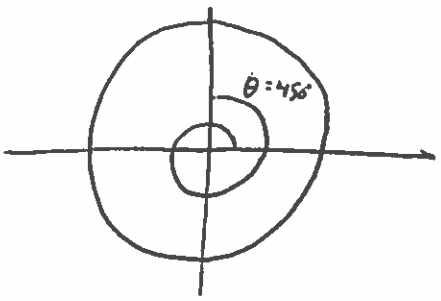
HW 5; 2.3A (3-5)
2.4A (1-4, 6, 7)
2.5A (2-8, 11, 13)

Section 2.3

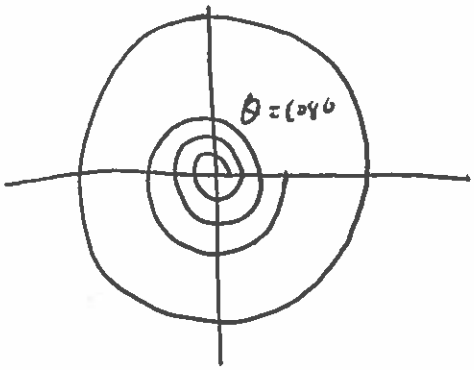
3a)



$\cos(450) = 0$

$\sin(450) = 1$

b)



$\cos(1080) = 1$

$\sin(1080) = 0$

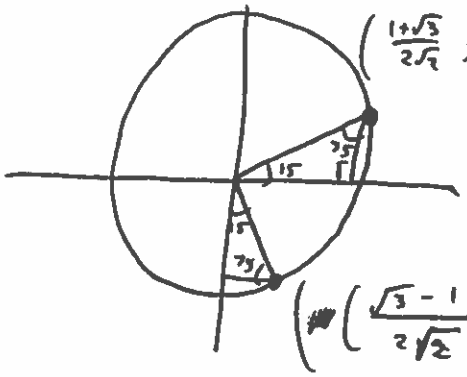
4a) $\cos(1395) = \cos(315) = \frac{\sqrt{2}}{2}$

$\sin(1395) = \sin(315) = \frac{-\sqrt{2}}{2}$

b) $\cos(1560) = \cos(120) = -\frac{1}{2}$

$\sin(1560) = \sin(120) = \frac{\sqrt{3}}{2}$

5)



$\left(\frac{1+\sqrt{3}}{2\sqrt{2}}, \frac{\sqrt{3}-1}{2\sqrt{2}}\right)$

$\left(\frac{\sqrt{3}-1}{2\sqrt{2}}, -\left(\frac{1+\sqrt{3}}{2\sqrt{2}}\right)\right)$

$\cos(285) = \frac{\sqrt{3}-1}{2\sqrt{2}}$

$\sin(285) = -\left(\frac{1+\sqrt{3}}{2\sqrt{2}}\right)$

Section 2.4

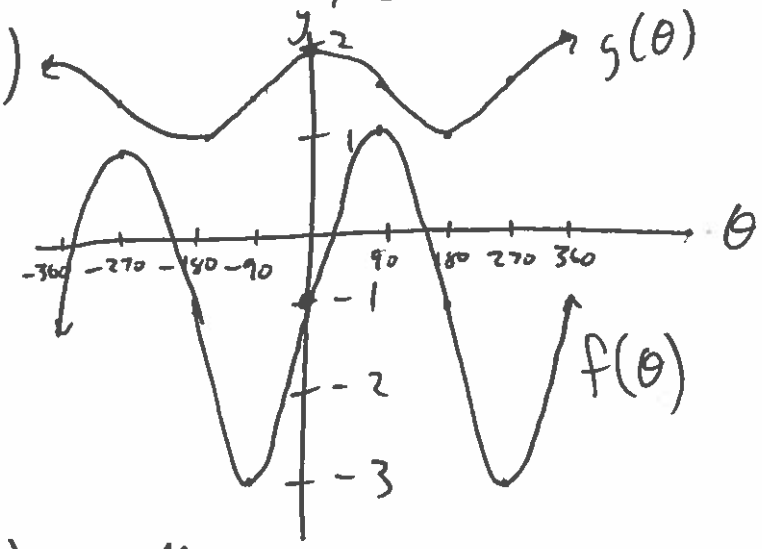
1a) midline: $y = -1$

amplitude: 2

b) midline: $y = \frac{3}{2}$

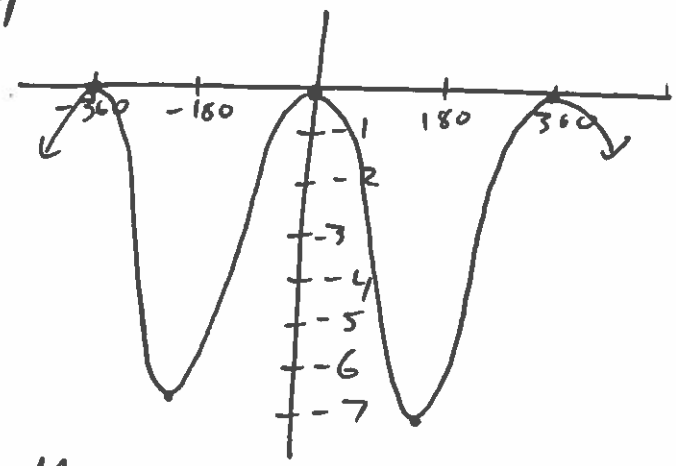
amplitude: $\frac{1}{2}$

c)



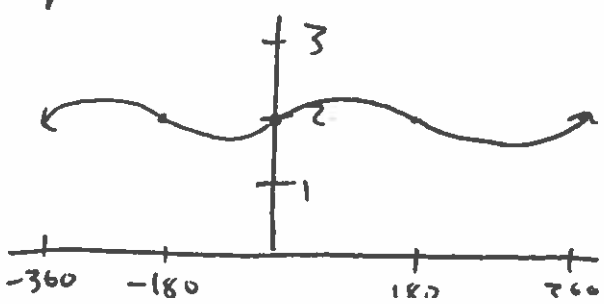
2a) midline: $y = -3$

amplitude: 3



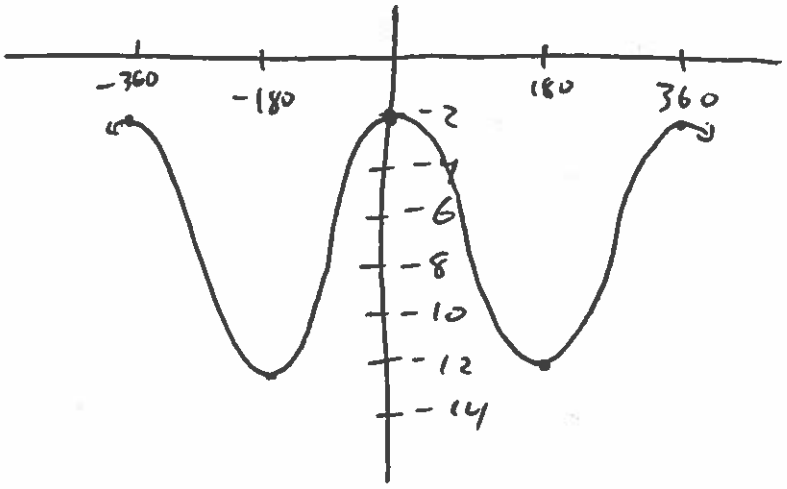
b) midline: $y = 2$

amplitude: $\frac{1}{3}$



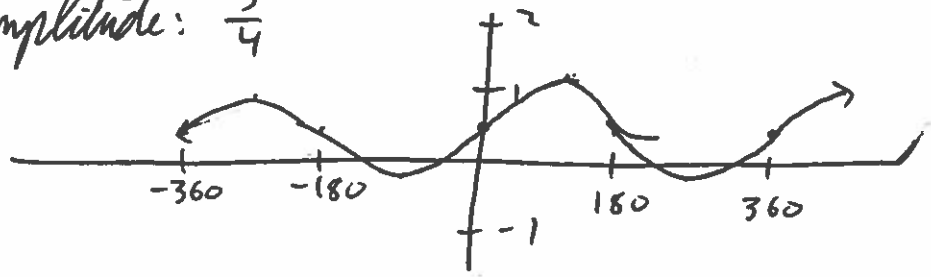
2c) midline: $y = -7$

amplitude: 5



d) midline: $y = \frac{1}{2}$

amplitude: $\frac{3}{4}$



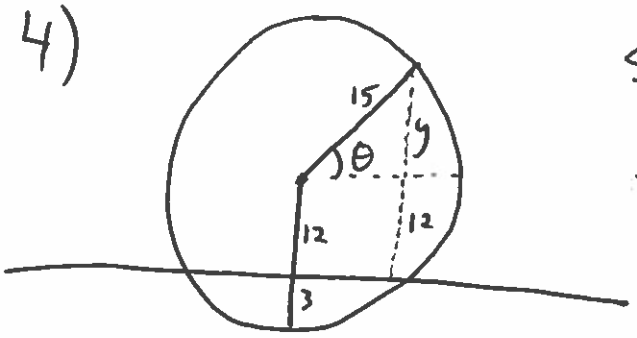
3a) $x = 3\cos(110) + 2 \approx .97$

$y = 3\sin(110) + 1 \approx 3.81$

b) $x = 3\cos(145) + 2 \approx -.46$

$y = 3\sin(145) + 1 \approx 2.72$

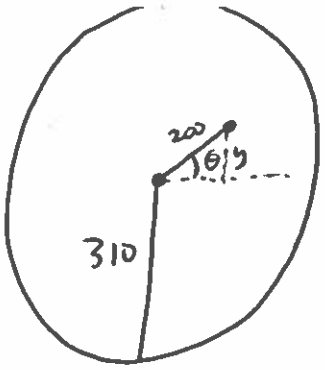
4)



$\sin\theta = \frac{y}{15} \rightarrow y = 15\sin\theta$

$\Rightarrow f(\theta) = 15\sin\theta + 12$

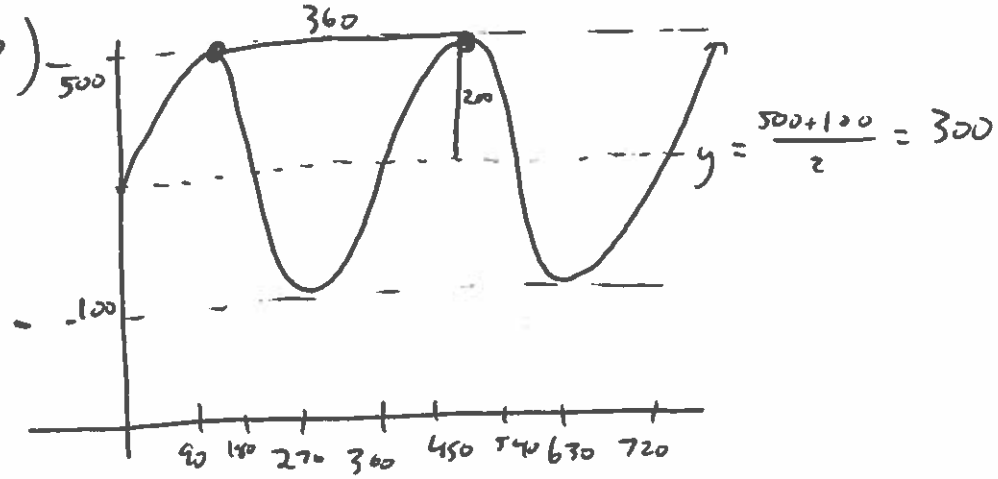
6)



$\sin\theta = \frac{y}{200} \rightarrow y = 200\sin\theta$

$\Rightarrow f(\theta) = 310 + 200\sin\theta$

7)



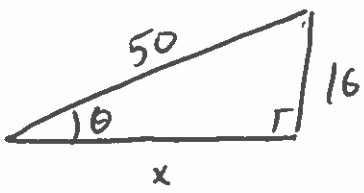
period : 360

midline : $y = 300$

amplitude : 200

Section 2.5

2)



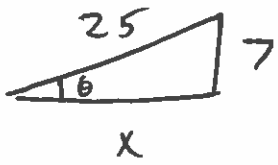
$x^2 + 16^2 = 50^2$

$x^2 + 256 = 2500$

$x^2 = 2244$

$x = \sqrt{2244}$

$\tan\theta = \frac{16}{x} = \frac{16}{\sqrt{2244}}$

3) 

$x^2 + 7^2 = 25^2$

$x^2 + 49 = 625$

$x^2 = 576$

$x = 24$

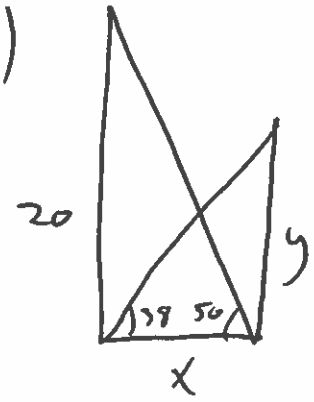
$\tan\theta = \frac{7}{x} = \frac{7}{24}$

4) $\tan 62 = \frac{5}{a} \rightarrow a \tan 62 = 5 \rightarrow a = \frac{5}{\tan 62} \approx 2.66$

5) ~~$\tan 52 = \frac{24}{l}$~~

$\tan 42 = \frac{l}{131} \rightarrow l = 131 \tan(42) \approx 117.95$

6) $\tan 52 = \frac{21}{l} \rightarrow l \tan(52) = 21 \rightarrow l = \frac{21}{\tan(52)} \approx 16.41$

7) 

$\tan 50 = \frac{20}{x} \rightarrow x \tan(50) = 20$

$\rightarrow x = \frac{20}{\tan(50)} \approx 16.78$

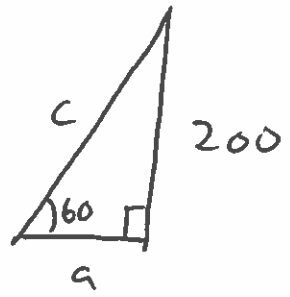
$\tan 38 = \frac{y}{x} \rightarrow y = x \tan(38) \approx 13.11$

8) slope: $\tan(60) = \sqrt{3}$

point: $(1,0)$

equation: $y - 0 = \sqrt{3}(x - 1)$

11a)



$\sin(60) = \frac{200}{c}$

$\rightarrow c\sin(60) = 200$

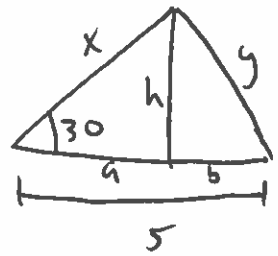
$\rightarrow c = \frac{200}{\sin(60)} = \frac{200}{(\sqrt{3}/2)} = \frac{400}{\sqrt{3}} \approx 230.94$

The cables should be around 230.94 feet long

b) $\cos(60) = \frac{a}{c} \rightarrow a = c\cos(60) = \frac{c}{2} \approx 115.47$

The cables should be placed around 115.47 feet from the base of the tower

13)



area $= 5 \rightarrow \frac{1}{2} \cdot 5 \cdot h = 5$

$\rightarrow h = 2$

$\sin(30) = \frac{h}{x} \rightarrow x\sin(30) = h \rightarrow x = \frac{h}{\sin(30)} = \frac{2}{\sin(30)}$

$= \frac{2}{(1/2)} = 4$

$\cos(30) = \frac{a}{x} \rightarrow a = x\cos(30) = 4\left(\frac{\sqrt{3}}{2}\right) = 2\sqrt{3}$

$b = 5 - a = 5 - 2\sqrt{3}$

$b^2 + h^2 = y^2 \rightarrow (5-2\sqrt{3})^2 + 2^2 = y^2$

$\rightarrow 25 - 20\sqrt{3} + 12 + 4 = y^2$

$\rightarrow 41 - 20\sqrt{3} = y^2$

$\rightarrow y = \sqrt{41 - 20\sqrt{3}} \approx 2.52$

perimeter $= 5 + x + y \approx 5 + 4 + 2.52 = 11.52$ in.