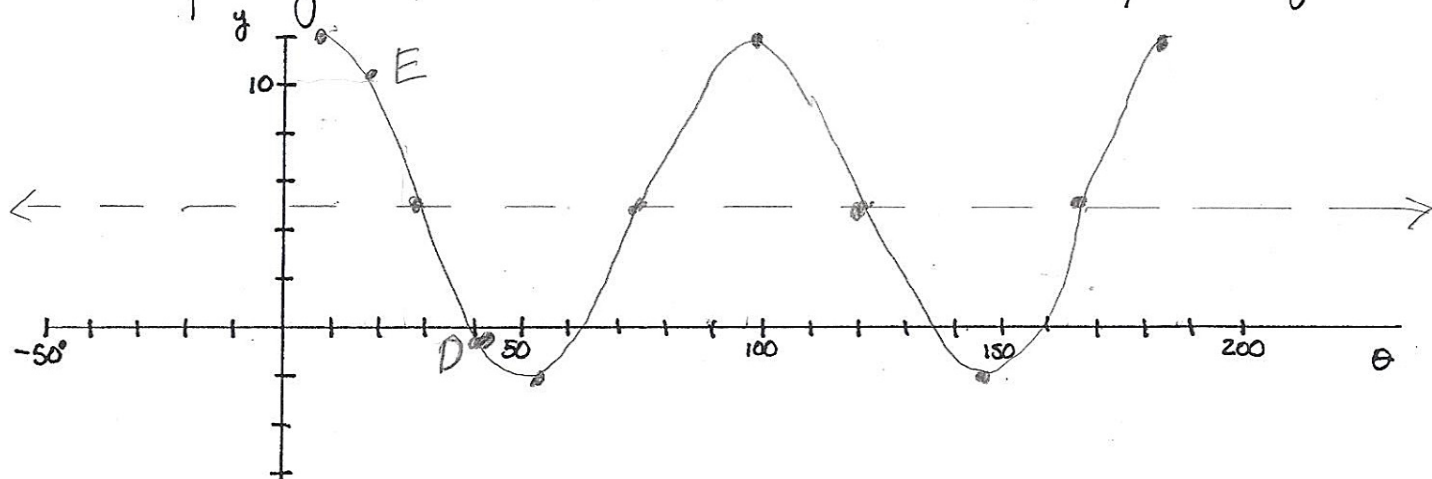


1. a. Graph $y = 5 + 7 \cos 4(\theta - 7^\circ)$. Show two complete cycles.



b. What is the amplitude of the function? 7 Period = $\frac{360^\circ}{4}$

c. What is the period of the function? 90° Period = 90°

d. Find y if $\theta = 42^\circ$. Show your process AND LABEL the point on the graph, "D".

$$\begin{aligned} y &= 5 + 7 \cos 4(42 - 7)^\circ \\ y &= 5 + 7 \cos [4(35)] \\ y &= 5 + 7 \cos (140) \\ y &\approx -0.362 \end{aligned}$$

e. Find θ if $y = 10$. Show your process and label the point on the graph, "E".

$$\begin{aligned} 10 &= 5 + 7 \cos [4(\theta - 7)] \\ 5 &= 7 \cos [4(\theta - 7)] \\ \frac{5}{7} &= \cos [4(\theta - 7)] \\ \cos^{-1}\left(\frac{5}{7}\right) &= 4(\theta - 7) \\ 44.4 &= 4(\theta - 7) \end{aligned}$$

$$\frac{44.4}{4} = \theta - 7$$

$$11.1 = \theta - 7$$

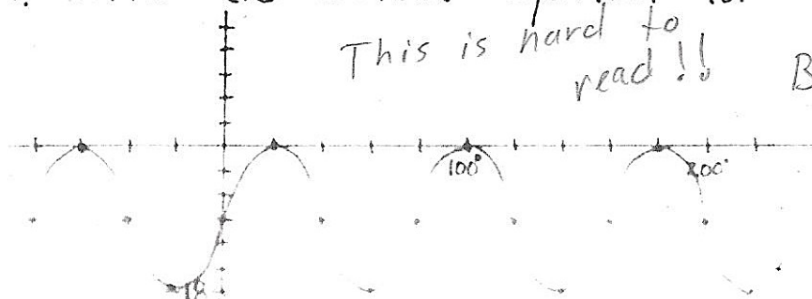
$$18.1^\circ = \theta$$

You can also use your calc.

2. Write the correct equation for this graph.

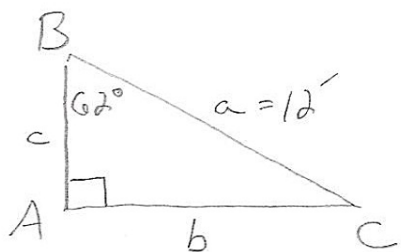
This is hard to read!!

$$B = \frac{360}{80} = \frac{9}{2}$$



$$y = -9 + 9 \cos \left[\frac{9}{2}(\theta - 20^\circ) \right]$$

1)



$$m\angle C = 28^\circ$$

$$\sin 62^\circ = \frac{b}{12}$$

$$\cos 62^\circ = \frac{c}{12}$$

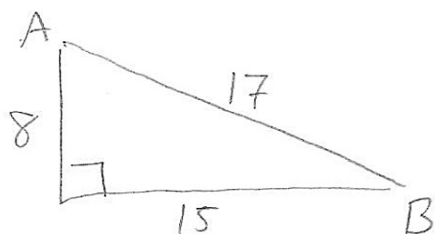
$$b = 12 \cdot \sin 62^\circ$$

$$c = 12 \cdot \cos 62^\circ$$

$$b \approx 10.595$$

$$c \approx 5.634$$

2)



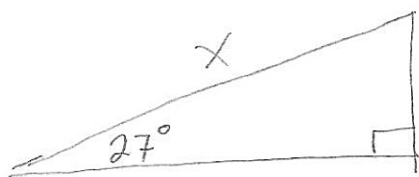
$$\sin A = \frac{15}{17}$$

$$m\angle A = \sin^{-1}\left(\frac{15}{17}\right)$$

$$m\angle A = 61.9^\circ$$

$$m\angle B = 28.1^\circ$$

3)



$$33,000' = 6.25 \text{ mi}$$

$$\sin 27^\circ = \frac{6.25}{X}$$

$$X = \frac{6.25}{\sin 27^\circ}$$

$$X = 13.767 \text{ miles}$$

$$\text{time} = 13.767 \text{ miles} \cdot \left(\frac{1 \text{ hr}}{450 \text{ mi}}\right) \cdot \left(\frac{60 \text{ min}}{1 \text{ hr}}\right) \approx 1.836 \text{ min}$$

$$4) \quad \frac{7\pi}{20} \cdot \frac{180^\circ}{\pi} = 63^\circ$$

$$250^\circ \cdot \frac{\pi}{180^\circ} = \frac{25\pi}{18} \text{ Radians}$$

$$1 \cdot \frac{180^\circ}{\pi} \approx 57.3^\circ$$

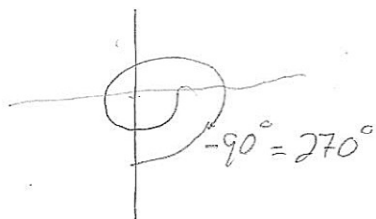
$$10 \text{ rev} \cdot \frac{2\pi}{1 \text{ rev}} = 20\pi \text{ Radians}$$

$$5) a) 800^\circ - 720^\circ = \boxed{80^\circ}$$

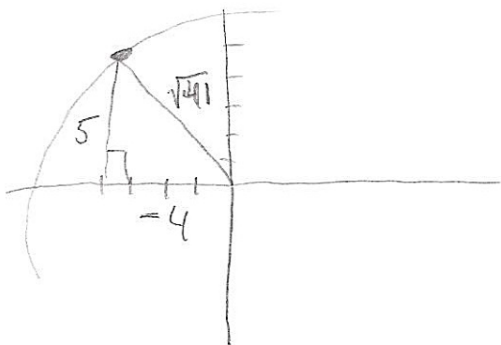
$$b) \frac{7\pi}{3} - \frac{6\pi}{3} = \boxed{\frac{\pi}{3}}$$

$$c) 720^\circ - 450^\circ = \boxed{270^\circ}$$

$$d) \frac{32\pi}{5} - \frac{30\pi}{5} = \boxed{\frac{2\pi}{5}}$$



6)



$$\begin{aligned} \sin \theta &= \frac{5}{\sqrt{41}} = \frac{5\sqrt{41}}{41} & \csc \theta &= \frac{\sqrt{41}}{5} \\ \cos \theta &= \frac{-4}{\sqrt{41}} = \frac{-4\sqrt{41}}{41} & \sec \theta &= -\frac{\sqrt{41}}{4} \\ \tan \theta &= \frac{-5}{4} & \cot \theta &= -\frac{4}{5} \end{aligned}$$

$$7) \cos 30^\circ = \frac{\sqrt{3}}{2}, \sin 30^\circ = \frac{1}{2}$$

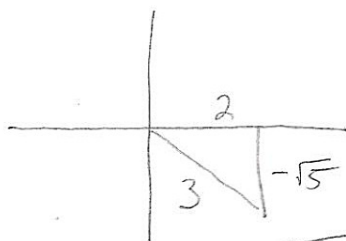
$$y = \cos^2 \theta - \sin^2 \theta$$

$$y = \left(\frac{\sqrt{3}}{2}\right)^2 - \left(\frac{1}{2}\right)^2$$

$$y = \frac{\sqrt{3}}{4} - \frac{1}{4}$$

$$\boxed{y = \frac{\sqrt{3} - 1}{4}}$$

8)



$$\boxed{\sin \theta = -\frac{\sqrt{5}}{3}}$$

$$9) a) C = 2\pi r$$

$$C = 2\pi(18)$$

$$\boxed{C = 36\pi}$$

b)

$$\frac{36\pi \text{ in}}{1} \cdot \frac{20 \text{ rev}}{1 \text{ min.}} = \boxed{\frac{720\pi \text{ in}}{1 \text{ min.}}}$$

$$\frac{720\pi \text{ in}}{1 \text{ min.}} \cdot \frac{1 \text{ ft}}{12 \text{ in.}} \cdot \frac{1 \text{ min.}}{60 \text{ sec}} = \frac{\pi \text{ ft}}{1 \text{ sec}}$$

$$\text{or } \boxed{3.14 \text{ ft/sec}}$$

$$10) a) 180^\circ + 40^\circ = \boxed{220^\circ}$$

$$b) \pi + \frac{\pi}{4} = \boxed{\frac{5\pi}{4} \text{ radians}}$$