

Question 10

$$a) \text{ if } 0 < \theta \leq 90$$

$$r = 10 \sec \frac{\theta}{2}$$

$$= 10 \frac{1}{\cos \frac{\theta}{2}}$$

$$\cos = \frac{\text{adj.}}{\text{hyp.}}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cos \frac{\theta}{2} = \frac{10}{r}$$

$$r = \frac{10}{\cos \frac{\theta}{2}} \Rightarrow \therefore r = 10 \sec \frac{\theta}{2}$$

$$b) \text{ ii } r = 20 \sin \frac{\theta}{2}$$

$$\sin = \frac{\text{opp.}}{\text{hyp}} \rightarrow \text{using } 90^\circ \Delta$$

$$\sin \frac{\theta}{2} = \frac{r}{20}$$

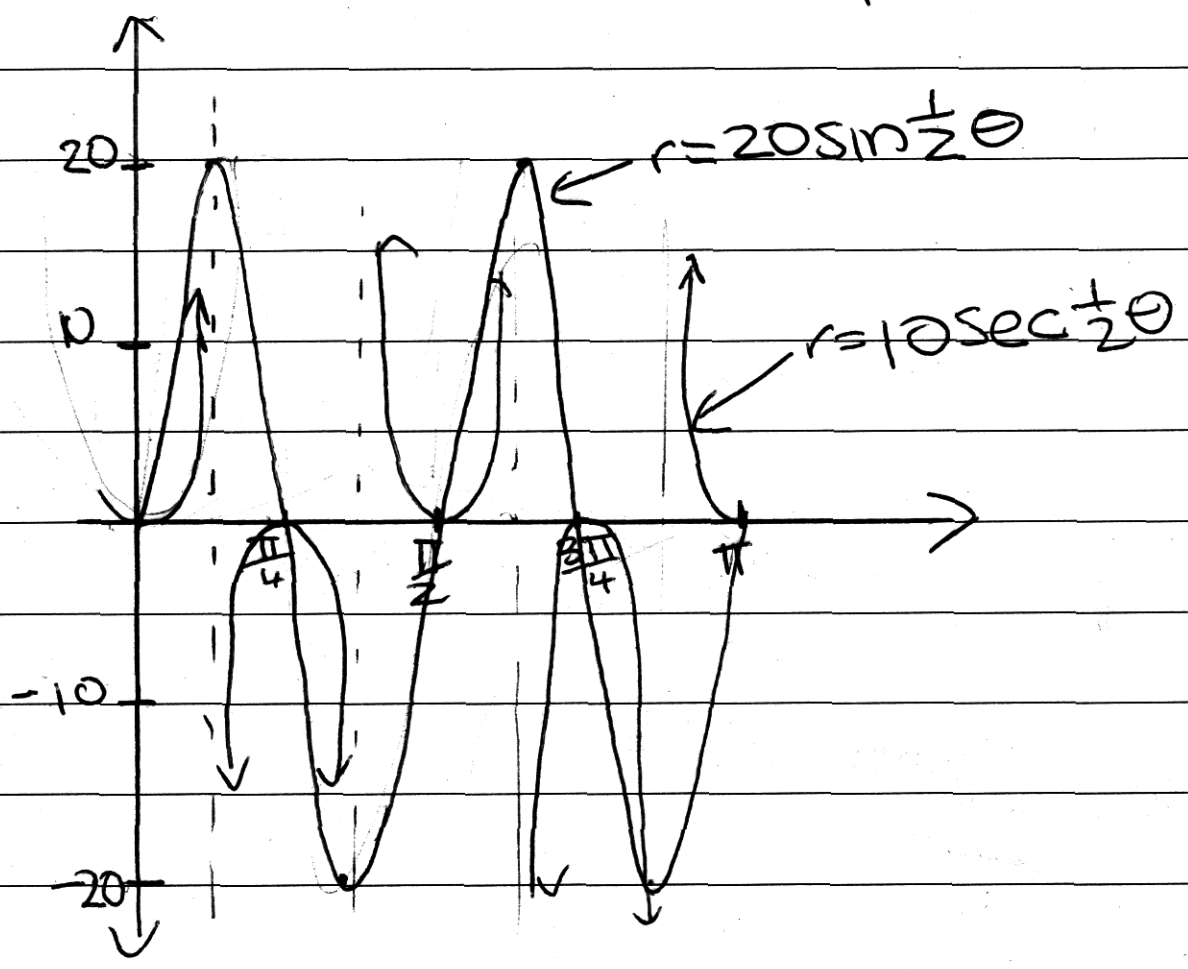
$$r = 20 \sin \frac{\theta}{2}$$

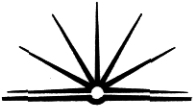


iii $r = 10 \sec \frac{\theta}{2}$

$r = 20 \sin \frac{1}{2} \theta$

amp = 10 period = $\frac{2\pi}{.5} = 4$ amp = 20





b) ~~1/2~~ $I = \frac{1}{b^2 + (x+8)^2} + \frac{1}{b^2 + (x-8)^2}$

=

$$\frac{dI}{dx} = \frac{-2P}{Q}$$

= 2