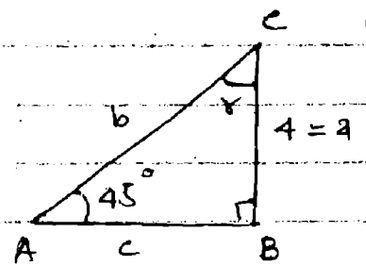
Exercise 12.2

Q.No.1 (i) From Figure

$a = 4$, $\alpha = 45^\circ$

$\therefore \frac{a}{c} = \tan 45^\circ$

$\Rightarrow \frac{4}{c} = (1) \Rightarrow \boxed{4 = c}$



Also $\frac{a}{b} = \sin 45$

$\Rightarrow \frac{4}{b} = 0.707 \Rightarrow \frac{4}{0.707} = b \Rightarrow \boxed{b = 5.657}$

Now $\alpha + \gamma = 90^\circ \Rightarrow \gamma = 90 - \alpha$

$= 90 - 45 \Rightarrow \boxed{\gamma = 45}$

(iii)

here $b = 5$, $c = 10$

From pythagoras theorem

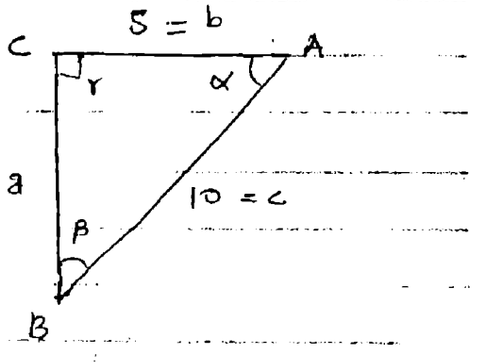
$c^2 = a^2 + b^2$

$\Rightarrow (10)^2 = a^2 + (5)^2$

$\Rightarrow 100 = a^2 + 25 \Rightarrow 100 - 25 = a^2$

$\Rightarrow a^2 = 75 \Rightarrow a = \sqrt{75}$

$\Rightarrow \boxed{a = 8.66}$



Now $\tan \alpha = \frac{a}{b} = \frac{8.66}{5} = 1.732$

$\Rightarrow \alpha = \tan^{-1}(1.732) \Rightarrow \alpha = 59.999 \approx 60$

i.e $\boxed{\alpha = 60^\circ}$

Now $\alpha + \beta = 90^\circ \Rightarrow \beta = 90 - \alpha$

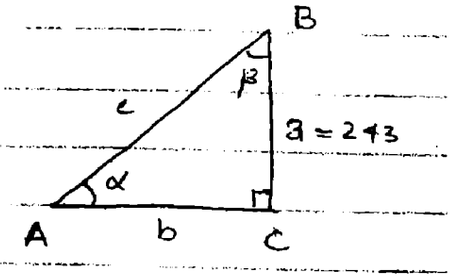
$= 90 - 60 \Rightarrow \boxed{\beta = 30^\circ}$

Q.No2 $\alpha = 37^\circ 20'$, $a = 243$

$\because \alpha + \beta = 90^\circ$

$\Rightarrow \beta = 90 - \alpha = 90 - 37^\circ 20'$

$\Rightarrow \boxed{\beta = 52^\circ 40'}$



Now $\sin \alpha = \frac{a}{c} \Rightarrow \sin 37^\circ 20' = \frac{243}{b}$

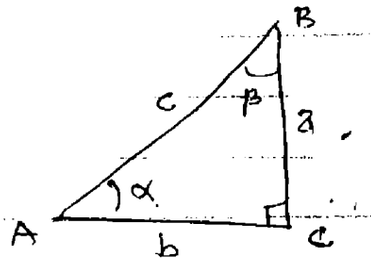
$\Rightarrow 0.606 = \frac{243}{b} \Rightarrow b = \frac{243}{0.606} \Rightarrow \boxed{b = 400.692}$

Now $\frac{a}{c} = \tan\alpha$

$\Rightarrow \frac{243}{c} = \tan 37^\circ 20' \Rightarrow \frac{243}{\tan 37^\circ 20'} = c$

$\Rightarrow c = \frac{243}{0.763} \Rightarrow \boxed{c = 318.598}$

Q No 5 $b = 68.4$, $c = 96.2$



By Pythagoras theorem

$c^2 = a^2 + b^2$

$\Rightarrow (96.2)^2 = a^2 + (68.4)^2$

$\Rightarrow 9254.44 = a^2 + 4678.56$

$\Rightarrow 9254.44 - 4678.56 = a^2$

$\Rightarrow a^2 = 4575.88 \Rightarrow \boxed{a = 67.645}$

Now $\tan\alpha = \frac{a}{b} = \frac{67.645}{68.4} = 0.98897$

$\Rightarrow \alpha = \tan^{-1}(0.98897) = 44.68$

$\Rightarrow \boxed{\alpha = 44^\circ 41'}$

Now $\alpha + \beta = 90^\circ$

$\Rightarrow \beta = 90 - \alpha = 90 - 44^\circ 41'$

$\Rightarrow \boxed{\beta = 45^\circ 19'}$

END