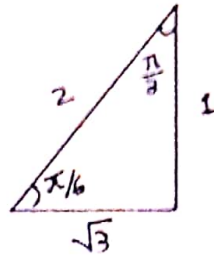
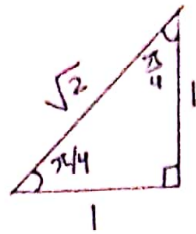
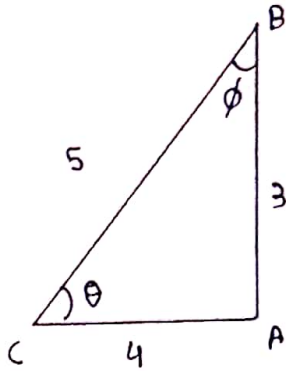


→ Two special triangles -



① Angles θ and ϕ in triangle A -



Using trigonometric ratios,

$$\sin \theta = \frac{AB}{BC}$$

$$\theta = \sin^{-1}\left(\frac{3}{5}\right)$$

$$= 36.87^\circ$$

$$\theta \text{ (in radians)} = \frac{36.87^\circ \times \pi}{180}$$

$$= 0.6435 \text{ radians}$$

for $\cos \phi$,

In a triangle,

$$\sum \text{Angles} = 180^\circ \text{ or } \pi$$

i.e. $\theta + \phi + \frac{\pi}{2} = \pi$

$$\phi = \pi - \frac{\pi}{2} - 0.6435$$

$$\phi = 0.9273 \text{ radians}$$

also,

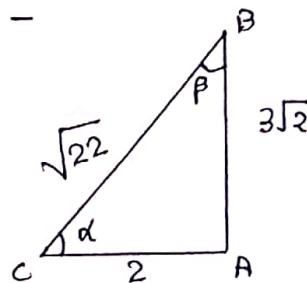
$$\sin \phi = \frac{AC}{BC}$$

$$\phi = \sin^{-1}\left(\frac{4}{5}\right)$$

$$= 53.13^\circ$$

$$\phi \text{ (radians)} = \frac{53.13 \times \pi}{180} = 0.9273 \text{ radians}$$

② Angles β and α in triangle B -



$$\therefore \sin \alpha = \frac{AB}{BC}$$

$$\alpha = \sin^{-1}\left(\frac{3\sqrt{2}}{\sqrt{22}}\right)$$

$$\alpha = 64.76^\circ$$

$$\alpha \text{ (radians)} = \frac{64.76 \times \pi}{180} = 1.1302 \text{ radians}$$

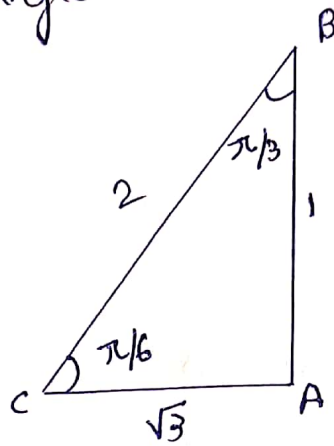
$$\cos \beta = \frac{AB}{BC}$$

$$\beta = \cos^{-1}\left(\frac{3\sqrt{2}}{\sqrt{22}}\right)$$

$$\beta = 25.24^\circ, \quad \beta = 25.24 \times \pi / 180$$

$$\beta \text{ (radians)} = 0.4405 \text{ radians}$$

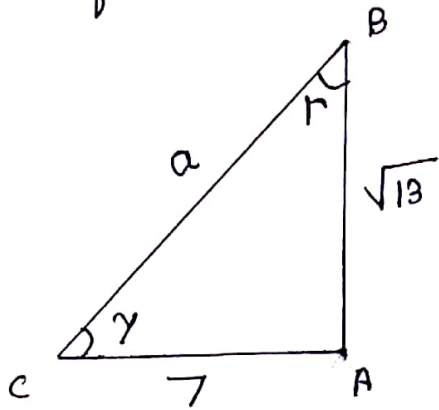
(c) $\cos(\pi/6)$
using special triangle -



$$\cos(\pi/6) = \frac{\text{Base}}{\text{Hypotenuse}}$$

$$= \frac{\sqrt{3}}{2} \approx \boxed{0.866}$$

④ Length of side a in triangle D :-



④

using pythagoras theorem,

$$BC^2 = AB^2 + AC^2$$

$$a^2 = (\sqrt{13})^2 + 7^2$$

$$a = \sqrt{13 + 49}$$

$$a = \sqrt{62} \approx 7.874$$

⑤ Angle γ in triangle D :-

$$\tan \gamma = \frac{\text{Perpendicular}}{\text{Base}}$$

$$\gamma = \tan^{-1}\left(\frac{\sqrt{13}}{7}\right)$$

$$\gamma = 27.25^\circ$$

$$\gamma \text{ (radians)} = \frac{27.25^\circ \times \pi}{180} = 0.4756 \text{ radians}$$

⑥ 21° to radians

$$\Rightarrow \frac{21^\circ \times \pi}{180^\circ}$$

$$\Rightarrow 0.3665 \text{ radians}$$

⑦ $\frac{\pi}{5}$ to degrees

$$\Rightarrow \frac{\pi}{5} \times \frac{180}{\pi}$$

$$\Rightarrow 36^\circ$$