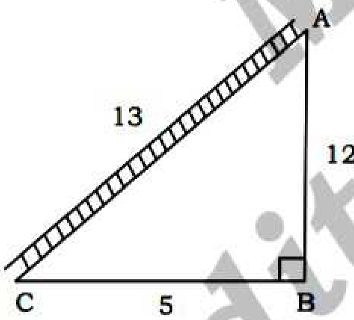
SOLUTIONS

1. (c)



$$\cos\theta = \frac{5}{13} = \frac{\text{Base}}{\text{Hypotenuse}}$$

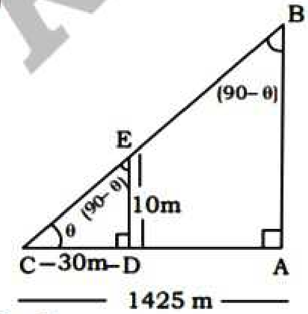
$$AB = \sqrt{15^2 - 5^2} = 12$$

$\because$ 12 = 18 m

$$5 = \frac{18}{12} \times 5$$

= 7.5 m

2. (a)

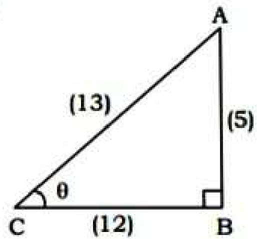


AB = ?

$$\because \frac{10}{30} = \frac{AB}{1425}$$

AB = 475 m

3. (a)



$$\because \cos\theta = \frac{12}{13} = \frac{B}{H}$$

$$AB = \sqrt{13^2 - 12^2}$$

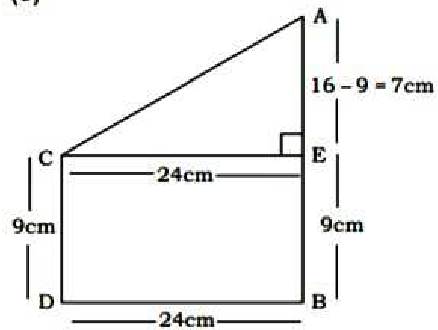
= (5unit)

$\because$ 12unit = 18 m

Height of a pole AB (5unit)

$$= \frac{18}{12} \times 5 = 7.5 \text{ m}$$

4. (c)



$\because$ AE = 7 cm

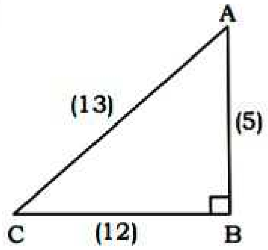
CE = 24 cm

AC = ?

$$AC = \sqrt{24^2 + 7^2} = \sqrt{576 + 49}$$

$$= \sqrt{625} = 25 \text{ cm}$$

5. (d)



$\because \sec\theta = \frac{13}{12} = \frac{H}{B}$

$AB = \sqrt{13^2 - 12^2}$

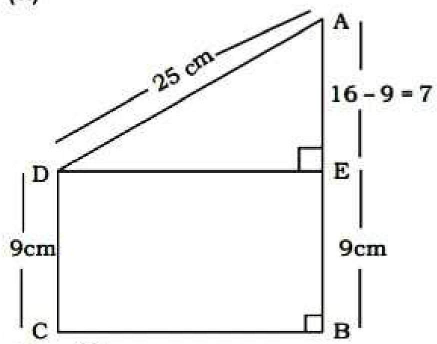
$= (5\text{unit})$

$\because$ (12unit) = 36 m

(5unit) = 15 m

Height of the pole = 15 m

6. (a)



AD = 25 cm

AE = 7 cm

DE = BC = ?

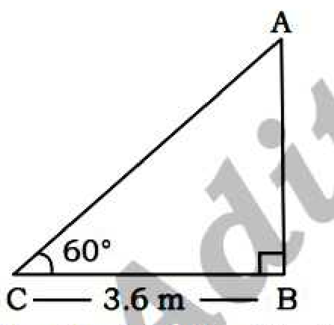
$BC = \sqrt{25^2 - 7^2}$

$= \sqrt{625 - 49}$

$= \sqrt{576}$

= 24 cm

7. (d)



Length of Ladder AC = ?

$\because \cos\theta = \frac{B}{H}$

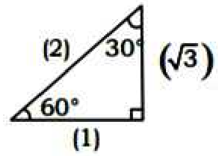
$\cos 60° = \frac{3.6}{AC}$

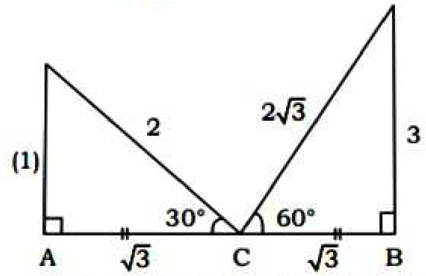
$\frac{1}{2} = \frac{3.6}{AC}$

AC = 7.2 m

8. (b)

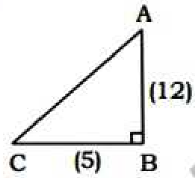
$\because$ In a right angle triangle





Ratio, height of B : A = 3 : 1

9. (c)

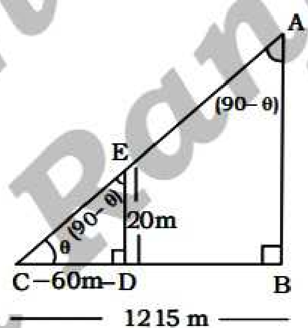


$\because \tan\theta = \frac{12}{5} = \frac{P}{B}$

$\because$ (12unit) = 24 m

(5unit) = 10 m

10. (c)



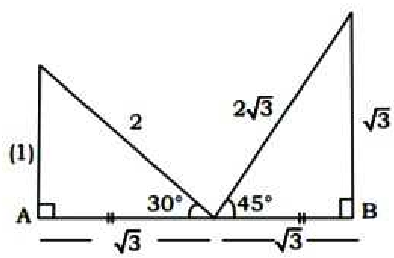
AB = Height of a mall = ?

$\because \frac{20}{60} = \frac{AB}{1215}$

$AB = \frac{1215}{3}$

= 405 m

11. (b)

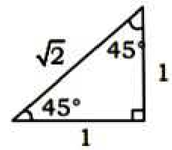


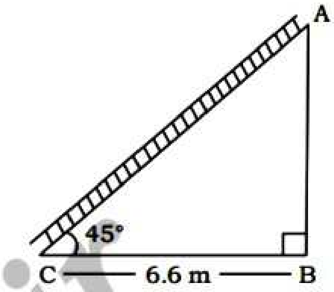
Ratio, Height of A : B = 1 : $\sqrt{3}$

12. (a)

The length of the ladder AC = ?

$\because$ In a right angle triangle





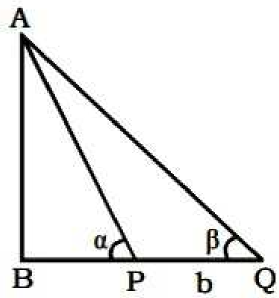
ATQ

1unit = 6.6m

then,

$\sqrt{2}$unit(AC) = $6.6\sqrt{2}$ m

13. (c)



Let hight of the pole is x cm

In ΔABQ

$= \tan\beta = \frac{x}{BQ}$

$BQ = x\cot\beta$

Similarly

In ΔABP

$\tan\alpha = \frac{x}{BP}$

$BP = x\cot\alpha$

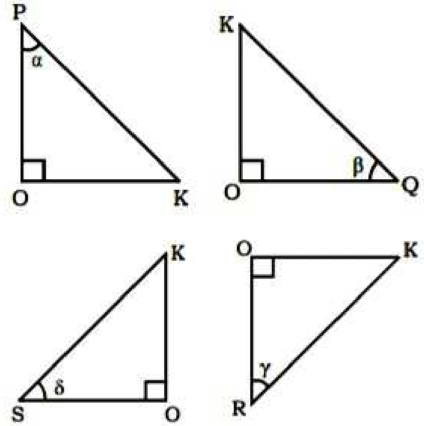
We know,

BQ = BP + PQ

$x\cot\beta = x\cot\alpha + b$

$x = \frac{b}{\cot\beta - \cot\alpha}$

14. (b)



Let K is the point on the top of the tower and the height of the clock tower OK be h cm OK is perpendicular to PR and SQ.

In ΔPOK,

$$\tan\alpha = \frac{OK}{OP}$$

$$OP = \frac{h}{\tan\alpha}$$

$OP = h\cot\alpha$

Similarly,

In ΔQOK

$$\tan\beta = \frac{OK}{OQ}$$

$$OQ = \frac{h}{\tan\beta}$$

$OQ = h\cot\beta$

In ΔPOQ, OP is perpendicular to OQ, then

$PQ^2 = OP^2 + OQ^2$

$PQ^2 = h^2\cot^2\alpha + h^2\cot^2\beta$

$PQ^2 = h^2(\cot^2\alpha + \cot^2\beta)$

Similarly,

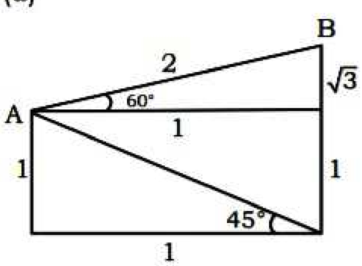
$RS^2 = h^2(\cot^2\gamma + \cot^2\delta)$

Now,

$$\left(\frac{PQ}{RS}\right)^2 = \frac{[h^2(\cot^2\alpha + \cot^2\beta)]}{[h^2(\cot^2\gamma + \cot^2\delta)]}$$

$$\left(\frac{PQ}{RS}\right)^2 = \frac{(\cot^2\alpha + \cot^2\beta)}{(\cot^2\gamma + \cot^2\delta)}$$

15. (d)



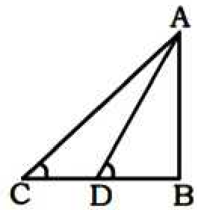
Given that,

1 unit = 36

Then,

$\sqrt{3}+1$ unit $= 36(\sqrt{3}+1) = 98$

16. (a)



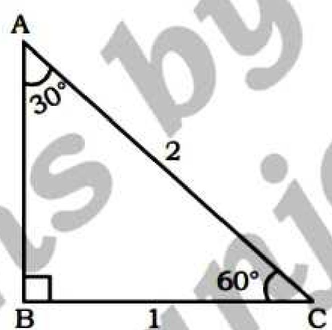
Note : When complementry are given in the question then, height of tower

$= \sqrt{BD \times BC}$

Height of the tower (AB)

$= \sqrt{32 \times 18} = 24m$

17. (c)

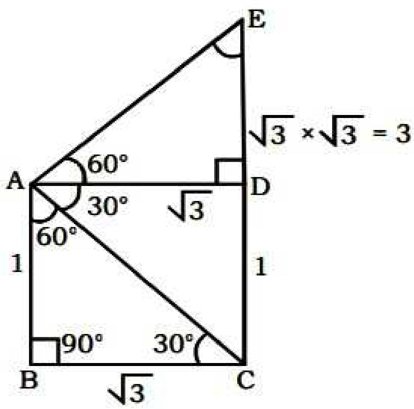


height (AB) = 123m (given)

The length of string (AC) $= \frac{123}{\sqrt{3}} \times 2$

$= 82\sqrt{3} = 82 \times 1.73 = 142$ m

18. (c)



AB = 12m (given)

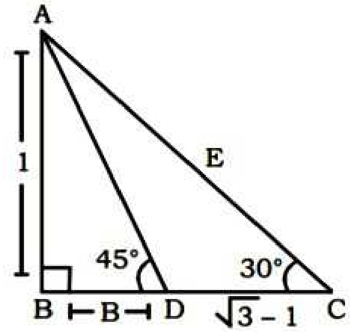
height of the hill = (ED + CD) = (3 + 1) = 4unit

1uniti = 12

Then,

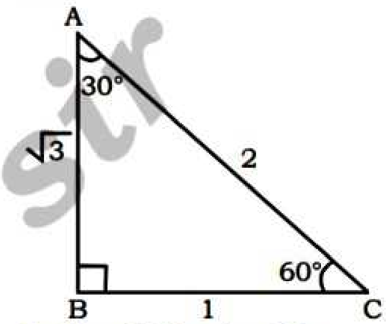
4unit $= \frac{12}{1} \times 4 = 48$m

19. (a)



$\Rightarrow \frac{45}{1} \times (\sqrt{3} - 1) = 32.9$m

20. (d)



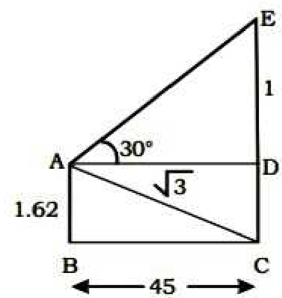
Ladder (AC)2unit = 22m

then,

$\sqrt{3}$unit(AB) = $11\sqrt{3}$ m

$AB = \frac{22}{2} \times \sqrt{3} = 11\sqrt{3}$

21. (d)

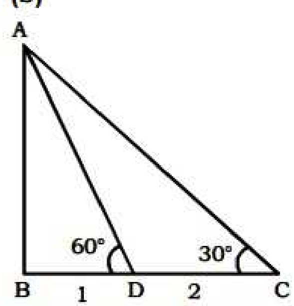


$DE = \frac{45}{\sqrt{3}} \times 1 = 15\sqrt{3} = 25.98$

Height of the pole = CD + DE

= 1.62 + 25.98 = 27.6 m

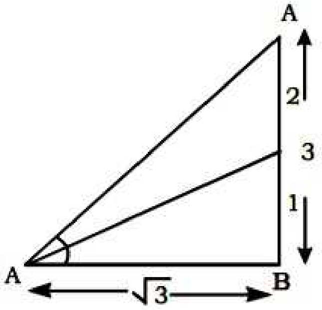
22. (b)



Height of the lamp-post,

$AB = \frac{32\sqrt{3}}{2} \times \sqrt{3} = \frac{96}{2} = 48$m

23. (d)



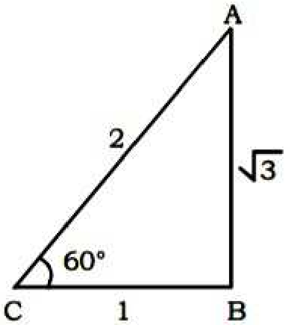
$\sqrt{3}$ unit = 300

Length of the tree increased by

$= \frac{300}{\sqrt{3}} \times 2 = 100 \times 2\sqrt{3}$

$= 200 \times 1.732 = 346.4$m

24. (d)



Given, BC = 6.5 m

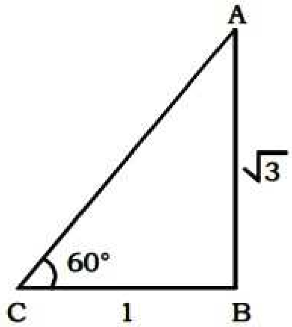
In ΔABC

$\cos 60° = \frac{BC}{AC}$

$\Rightarrow \frac{1}{2} = \frac{6.5}{AC}$

$\Rightarrow AC = 2 \times 6.5 = 13$m

25. (a)



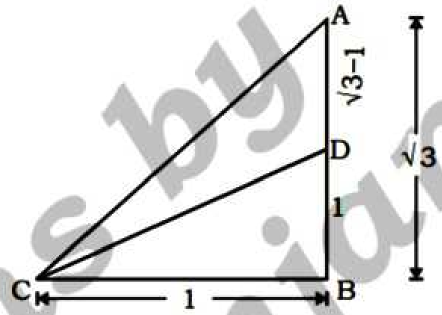
1 unit(AB) = 4.2 cm

then,

$\sqrt{3}\text{unit}(AB) = \frac{4.2}{1} \times \sqrt{3}$

$= 4.2 \times 1.73 = 7.3$ m

26. (d)



Let the pole be AD and Tower be BD.

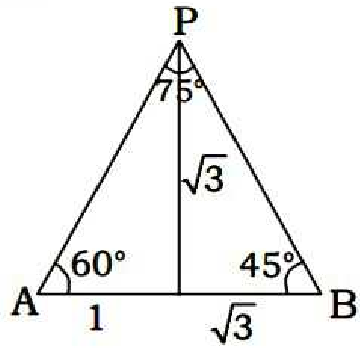
Given, AD = 7 m

$(\sqrt{3}-1)$unit = 7 m

So, The tower BD$= \frac{7}{(\sqrt{3}-1)} \times 1$

$\Rightarrow \frac{7}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{7(\sqrt{3}+1)}{2}$ m

27. (b)



Given that

$\sqrt{3}-1$unit : 42

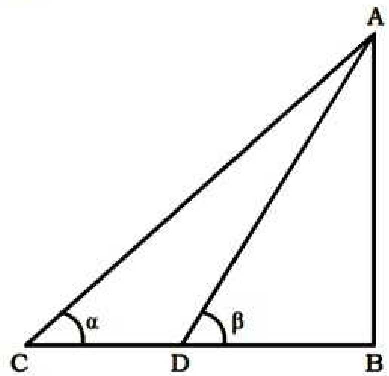
then,

$\sqrt{3}$unit

$= \frac{42\sqrt{3}}{\sqrt{3}-1} = \frac{42\sqrt{3}}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1}$

$= 63 + 21\sqrt{3} = 99.4$m

28. (b)



When $\alpha = \beta = 90°$ then, AB $= \sqrt{BD \times BC}$

Given, BD = 48 and BC = 75

Height of the pole = $\sqrt{75 \times 48}$

= 60 m

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