# Height & Distance Questions for CGL Tier 2, CGL Tier 1 and SSC 10+2 Exams

## HEIGHT AND DISTANCE QUIZ 1

Directions: Study the following questions carefully and choose the right answer:

**1. The angles of depression of two ships from the top of a light house are 45° and 30° towards east. If the ships are 200 m apart, find the height of the light house.**

A. 100 m B. 173 m C. 200 m D. 273 m

**2. The angle of elevation of the top of an unfinished pillar at a point 150 m from its base is 30°. If the angle of elevation at the same point is to be 45°, then the pillar has to be raised to a height of how many metres?**

A. 59.4 m B. 61.4 m C. 62.4 m D. 63.4 m

**3. From the top of a cliff 90 m high, the angles of depression of the top and bottom of a tower are observed to be 30° and 60°, respectively. What is the height of the tower?**

A. 30 m B. 45 m C. 60 m D. 75 m



**4. A telegraph post gets broken at a point against a storm and its top touches the ground at a distance 20 m from the base of the post making an angle 30° with the ground. What is the height of the post?**

A. $\frac{40}{\sqrt{3}}$ m B. $\frac{20}{\sqrt{3}}$ m C. $\frac{40}{\sqrt{3}}$ m C. $40\sqrt{3}$ m

**5. The shadow of a tower is 15 m when the sun's elevation is 30°. What is the length of the shadow when the sun's elevation is 60°?**

A. 3 m B. 4 m C. 5 m D. 6 m

**6. At an instant, the length of the shadow of a pole is square root of 3 times the height of the pole. Find the angle of elevation of the turn.**

A. 30° B. 45° C. 60° D. 75°

**7. Two poles of heights 6 m and 11 m stand vertically upright on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops?**

A. 11 m B. 12 m C. 13 m D. 14 m

**8. A pole stands vertically, inside a saclene triangular park ABC, if the angle of elevation of the top of the pole from each corner of the park is same, then in ΔABC, the foot of the pole is at the**

A. centroid B. circumcentre C. incentre D. orthocenter

**9. If the anlge of elevation of a balloon from two consecutive km stones along a road are 30 degree and 60 degree respectively, then the height of the balloon above the ground will be**

A. 3 km 2 B. 1 km C. 2 km D. 3 3 km

**10. A vertical stick 12 cm long casts a shadow 8 cm long on the ground. At the same time, a tower casts a shadow 40 m long on the ground. The height of the tower is**

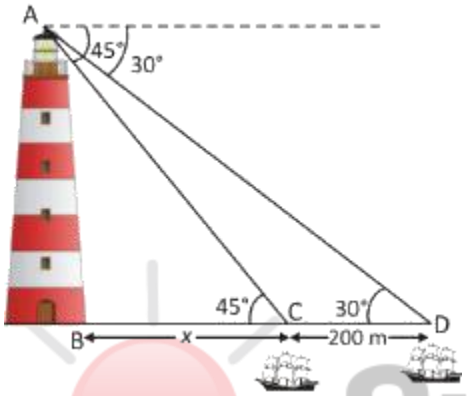
A. 72 m B. 60 m C. 65 m D. 70 m

**Correct answers:**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| D | D | C | B | C | A | C | B | A | B |

**Explanations:**

**1.**






Given,

$\angle ACB = 45°$

$\angle ADB = 30°$

and distance between two ships, i.e.,

CD = 200 m

Then, AB = ?

Let BC = x m

In $\Delta ABC$,

$\tan 45° = \frac{AB}{BC}$

($\because \tan 45° = 1$)

$1 = \frac{AB}{x}$

∴ AB = x m ....(i)

In ΔABD, $\tan 30° = \frac{AB}{BD}$

∴ $\frac{1}{\sqrt{3}} = \frac{AB}{x+200}$

(∵ tan 30° = 1/√3 )

$x = \sqrt{3}\,AB - 200$ ...(ii)

From Eqs. (i) and (ii),

$AB = \sqrt{3}AB - 200$

$\sqrt{3}\,AB - AB = 200$

0.732 AB = 200

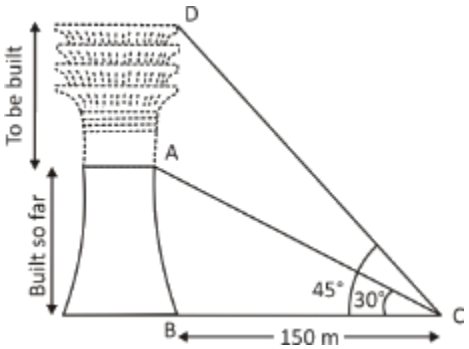
(∵$\sqrt{3}$ = 1.732)

$AB = \frac{200}{0.732} = 273.22$

= 273 m

Hence, option D is correct.

**2.**




Given, BC = 150 m

$\angle ACB = 30°$

and, $\angle DCB = 45°$

Then, AD = ?

In $\Delta ABC$, $\tan 30° = \frac{AB}{BC}$

$\frac{1}{\sqrt{3}} = \frac{AB}{150}$

$\therefore AB = \frac{150}{\sqrt{3}} = 86.6m$

In $\Delta DBC$, $\tan 45° = \frac{DB}{BC}$

$1 = \frac{DB}{150}$

DB = 150

AD + AB = 150

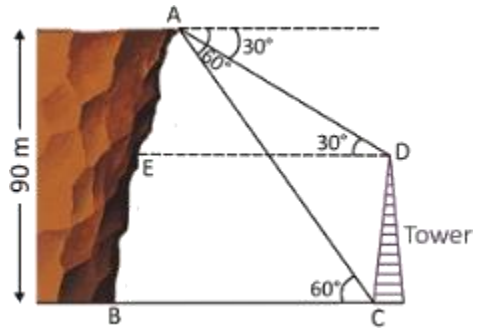
[$\because$ DB = AD + AB]

$\therefore$ AD = 150 – AB

= 150 – 86.6 = 63.4m

Hence, option D is correct.

**3.**




Given, AB = 90 m

∠ADE = 30°

And ∠ACB = 60°

Then, DC = ?

Ratio of angles,

$$\frac{\tan 30°}{\tan 60°} = \frac{\frac{AE}{ED}}{\frac{AB}{BC}}$$

[∵ ED = BC]

$$\frac{\frac{1}{\sqrt{3}}}{\sqrt{3}} = \frac{AE}{90}$$

$$\frac{1}{3} = \frac{AE}{90}$$

AE = 30 m

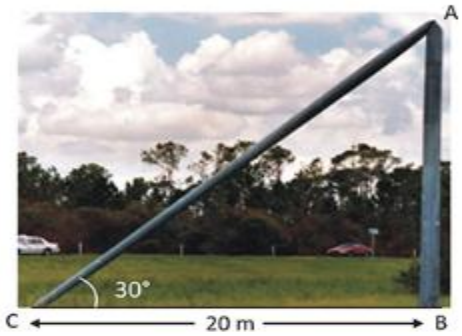
Now, DC = EB

= AB – AE

= 90 – 30 = 60 m

Hence, option C is correct.

**4.**



Given, BC = 20 m

∠ACB = 30°

Total height of the telegraph post is (AB + CA) = ?

In Δ ABC, $\tan 30° = \frac{AB}{BC}$

$\frac{1}{\sqrt{3}} = \frac{AB}{20}$

$\therefore AB = \frac{20}{\sqrt{3}}$ m

Now, $\cos 30° = \frac{BC}{AC}$

$\frac{\sqrt{3}}{2} = \frac{20}{AC}$

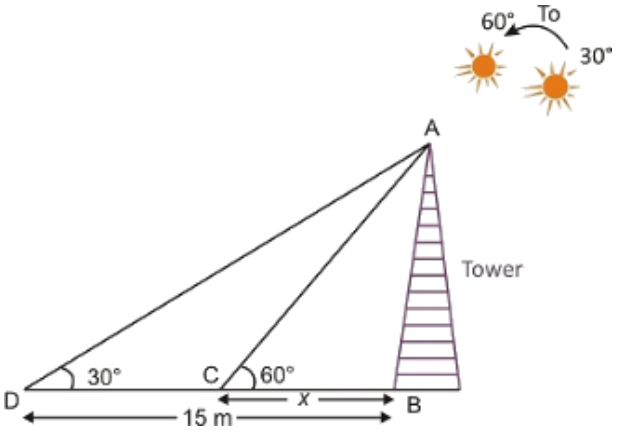
$\therefore AC = \frac{40}{\sqrt{3}}$ m

So, $AB + CA = \frac{20}{\sqrt{3}} + \frac{40}{\sqrt{3}} = \frac{60}{\sqrt{3}}$

$= 20\sqrt{3}$ m

Hence, option B is correct.

**5.**



Given, ∠ADB = 30° and ∠ ACB = 60°

When the sun's elevation is 30°, the shaadow of tower is "BD = 15 m" and when the sun's elevation is 60°, the shadow of tower is "BC = ?"

Let, BC = *x* m

In ΔABD, tan 30° = AB/BD

$\frac{1}{\sqrt{3}} = \frac{AB}{15}$

$\therefore AB = \frac{15}{\sqrt{3}}$ ....(i)

In ΔABC, tan 60° = AB/BC

$\sqrt{3} = \frac{AB}{x}$

$\therefore AB = x\sqrt{3}$ ...(ii)

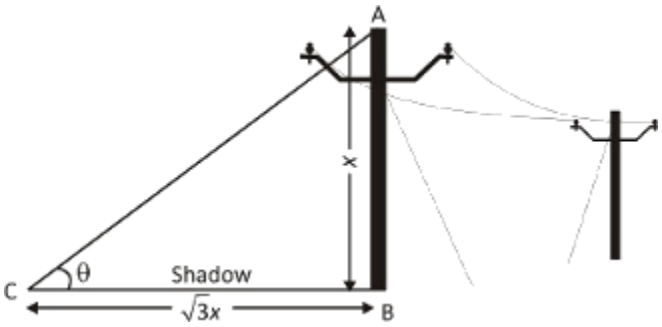
From Eqs. (i) and (ii), we get

$x\sqrt{3} = \frac{15}{\sqrt{3}}$

x = 5 m

Hence, option C is correct.

**6.**



Let AB = x

Then, BC = $\sqrt{3}$ x

and θ = ?

In ΔABC, tan θ = $\frac{x}{\sqrt{3}\,x}$

tan θ = $\frac{1}{\sqrt{3}}$

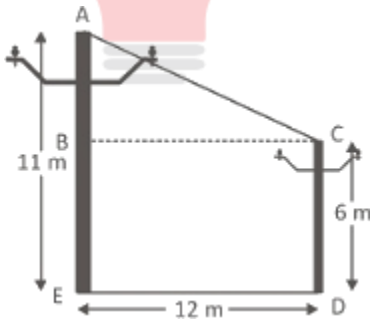
tan θ = tan 30°

[∵ tan 30° = 1/√3]

∴ θ = 30°

Hence, option A is correct.

**7.**




Given that ther are two poles

AE = 11 m

and, CD = 6 m

∴ BE = 6 m

[∵CD = BE]

∴ AB = AE – BE = 11 – 6 = 5m

distance between their feet

ED = 12 m

∴ BC = 12 m [∵ED = BC]

Now, AC = ?

In ΔABC,

From Pythagorus theorum,

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

$AC^2 = 5^2 + 12^2$

$AC^2 = 25 + 144 = 169$

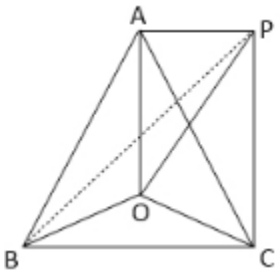
AC = √169

AC = 13

Hence, option C is correct.



**8.**

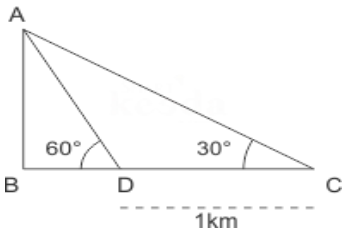



AP = CP = BP

It is possible only when OA = OB = OC i.e. radii of circum circle.

Hence, option B is correct.

**9.**




AB = Height of balloon = h km

BD = x km, CD = 1 km

From Δ ABD,

$\tan 60° = \frac{AB}{BD}$

$\Rightarrow \sqrt{3} = \frac{h}{x}$

$\Rightarrow x = \frac{h}{\sqrt{3}}$ km ...(1)

From Δ ABC,

$\tan 30° = \frac{AB}{BC}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{h}{\frac{h}{\sqrt{3}} + 1}$

$\Rightarrow \sqrt{3}\, h = \frac{h}{\sqrt{3}} + 1$

$\Rightarrow \sqrt{3}\, h - \frac{h}{\sqrt{3}} - 1$

$\Rightarrow \frac{3h - h}{\sqrt{3}} = 1$

$\Rightarrow 2h = \sqrt{3} \Rightarrow h = \frac{\sqrt{3}}{2}$ km

Hence, option A is correct.

**10.**

We can solve it through ratio proportion rule,

let the tower is x m long, then

12 cm stick casts → 8 cm shadow

x m tower casts → 40 m shadow

On cross multiplying, we get

$x = \frac{12 \times 40}{8} = 60$ m

Hence, option B is correct.