Extra Content for Foundation GCSE

119. Understanding and Using SOH-CAH-TOA in Trigonometry

Practice Questions

1. What does SOH-CAH-TOA stand for in trigonometry?

2. Identify the opposite, adjacent, and hypotenuse in a right-angled triangle where the given angle is at the bottom left.

3. A right-angled triangle has an angle of 30° and a hypotenuse of 10 cm. Find the opposite side using sine.

4. A ladder leans against a wall, making a 60° angle with the ground. The ladder is 5 m long. Find the height it reaches on the wall.

5. A ramp is 4 m long and rises at an angle of 25°. Find how high it lifts.

6. A right-angled triangle has an adjacent side of 7 cm and an angle of 40°. Find the hypotenuse.

7. Find x: A right-angled triangle has an opposite side of 8 cm and a hypotenuse of 12 cm. Find the angle using sine.

8. A building casts a shadow of 15 m. If the angle of elevation of the sun is 50°, find the building's height.

9. A tree is 9 m tall and casts a shadow of 12 m. Find the angle of elevation of the sun.

10. A zip line is 20 m long and forms a 35° angle with the horizontal. Find how high it starts from the ground.

119. Understanding and Using SOH-CAH-TOA in Trigonometry

Scenario Questions

1. A pilot is descending at a 10° angle to the runway. If the plane is 500 m above the ground, how far is it from landing?

2. A hiker climbs a slope at a 20° incline. If the slope is 200 m long, how much height does the hiker gain?

3. A TV antenna is attached to a vertical pole with a wire of 15 m making a 50° angle with the ground. Find the height of the pole.

4. A ramp is designed at a 30° angle to load goods onto a truck. If the ramp is 6 m long, find the height of the truck.

5. A lighthouse observer sees a boat at a 25° angle of depression. The lighthouse is 40 m tall. Find the distance of the boat from the lighthouse base.

6. A football is kicked at a 40° angle. If it travels 30 m along the ground, how high does it reach at its peak?

7. A crane extends a 20 m cable at a 75° angle to lift a box. How high does the box go?

8. A kite string is 50 m long and makes a 60° angle with the ground. Find the height of the kite.

9. A car drives 100 m up a 15° slope. Find the vertical height gained.

10. A road bridge has a 5° incline and is 500 m long. Find the height difference between the start and the end.

Extra Content for Foundation GCSE

119. Understanding and Using SOH-CAH-TOA in Trigonometry

Practice Questions

1. SOH-CAH-TOA stands for:
   - SOH: Sine = Opposite / Hypotenuse
   - CAH: Cosine = Adjacent / Hypotenuse
   - TOA: Tangent = Opposite / Adjacent

2. Opposite: side opposite the given angle; Adjacent: side next to the given angle; Hypotenuse: side opposite the right angle.

3. Opposite side: $5\,\text{cm}$

4. Height: $5 \times \sin(60°) \approx 4.33\,\text{m}$

5. Height: $4 \times \sin(25°) \approx 1.69\,\text{m}$

6. Hypotenuse: $7/\cos(40°) \approx 9.14\,\text{cm}$

7. Angle: $\sin^{-1}(8/12) \approx 41.81°$

8. Building height: $15 \times \tan(50°) \approx 17.88\,\text{m}$

9. Angle of elevation: $\tan^{-1}(9/12) \approx 36.87°$

10. Height: $20 \times \sin(35°) \approx 11.47\,\text{m}$

Scenario Questions

1. Distance from landing: $500/\tan(10°) \approx 2835.64\,\text{m}$

2. Height gained: $200 \times \sin(20°) \approx 68.40\,\text{m}$

3. Pole height: $15 \times \sin(50°) \approx 11.49\,\text{m}$

4. Truck height: $6 \times \sin(30°) = 3\,\text{m}$

5. Distance of the boat: $40/\tan(25°) \approx 85.84\,\text{m}$

6. Peak height: $30 \times \tan(40°) \approx 25.17\,\text{m}$

7. Box height: $20 \times \sin(75°) \approx 19.32\,\text{m}$

8. Kite height: $50 \times \sin(60°) \approx 43.30\,\text{m}$

9. Vertical height: $100 \times \sin(15°) \approx 25.88\,\text{m}$

10. Height difference: $500 \times \sin(5°) \approx 43.58\,\text{m}$