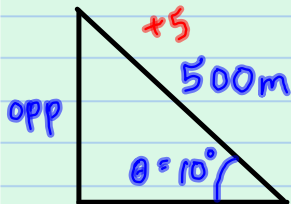


1. A train slowly climbs a 500-m mountain track which is at an angle of 10.0° with respect to the horizontal. How much altitude does it gain?



$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

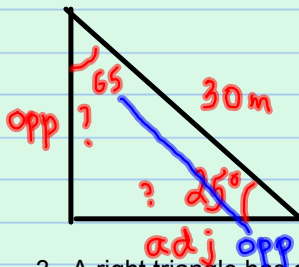
$$\text{opp} = \text{hyp} \sin \theta$$

$$= 500 \sin 10$$

$$= 87 \text{ m}$$

$$\sqrt{x} = x^{\frac{1}{2}}$$

2. A right triangle has a hypotenuse of 30 m. The base of the triangle lies horizontal and the height of the triangle vertical and opposite from a 25° angle. Find two things, the height of the triangle and the base of the triangle.



$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\text{hyp} \sin \theta = \text{opp}$$

$$30 \sin 25 = \text{opp}$$

$$\text{height} = \text{opp} = 12.7 \text{ m}$$

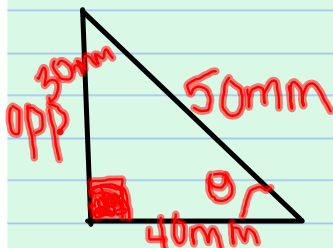
$$65^\circ \text{ opp} = \text{hyp} \sin \theta$$

$$= 30 \sin 65$$

$$= 27 \text{ m}$$

OR $c^2 = a^2 + b^2$
 $30^2 - 12.7^2 = b^2$
 $= 27 \text{ m}$

3. A right triangle has a base of 40 mm and a hypotenuse of 50 mm. Find the angle adjacent to the 40mm base and the length of the opposite side from the angle.



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

$$50^2 = \text{opp}^2 + 40^2$$

$$2500 - 1600 = \text{opp}^2$$

$$900 = \text{opp}^2$$

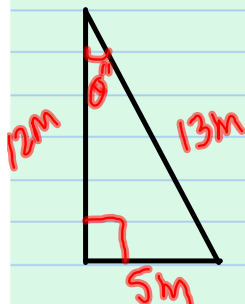
$$30 = \text{opp}$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\theta = \sin^{-1} \frac{\text{opp}}{\text{hyp}} = \sin^{-1} \frac{30}{50}$$



4. A right triangle has sides 5.0 m, 12 m, and 13 m. The smallest angle of this triangle is what value?



$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\theta = \sin^{-1} \frac{\text{opp}}{\text{hyp}}$$

$$\theta = \sin^{-1} \frac{5}{13}$$

$$\theta = 23^\circ$$