

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

$\cos \theta = \frac{\text{adj}}{\text{hyp}}$

$\tan \theta = \frac{\text{opp}}{\text{adj}}$

Unit 2: Trigonometry

KEEP CALM
AND
SOHCAHTOA

2.3 Calculating Angles

Recall: a) $\sin x^\circ = 0.45$ b) $\cos y^\circ = 0.1624$ c) $\tan z^\circ = 5.2$

$x = 27^\circ$ $y = 81^\circ$ $z = 79^\circ$

Ex.) Determine the size of angle a.

$\cos a^\circ = \frac{16}{34}$

$\cos^{-1}(16/34)$

$a = 62^\circ$

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Ex.) Determine the size of the missing angle.

a)

$\sin x^\circ = \frac{4}{6}$

$x = 42^\circ$

b)

$\cos b^\circ = \frac{10}{19}$

$b = 58^\circ$

c)

$\sin c^\circ = \frac{21}{29}$

$\tan c^\circ = \frac{21}{20}$

$c = 46^\circ$

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Ex.) Calculate the size of angle CAB to the nearest degree.

$\sphericalangle CAB$
 $= 14^\circ \times 2$
 $= 28^\circ$

$\sin \theta = \frac{1.5}{6.2}$

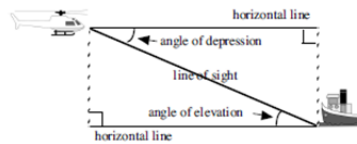
$\theta = 14^\circ$

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$\tan \theta = \frac{\text{opp}}{\text{adj}}$

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- * *Angle of elevation* is measured **upwards** from the **horizontal**.
- * *Angle of depression* is measured **downwards** from the **horizontal**.

Ex.) A tree 5.1 m tall casts a shadow 7.5 m long. Calculate the angle of elevation of the sun to the nearest tenth of a degree.

* shadow 7.5m

$\tan \theta = \frac{5.1}{7.5}$ ✓

$\theta = 34.2^\circ$ ✓

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$\tan \theta = \frac{\text{opp}}{\text{adj}}$

Ex.) A pole is 11m high, and is supported by a 13m guy wire which is attached to the ground. (Draw a picture.)

a) Calculate, to the nearest degree, the angle between the wire and the ground.

$$\sin \theta = \frac{11}{13} \quad \theta = 58^\circ$$

b) Calculate the distance, to the nearest 0.1m, between the point where the wire is fixed to the ground and the foot of the pole.

$$c^2 - b^2 = a^2$$

$$\sqrt{13^2 - 11^2} = \sqrt{x^2}$$

$$x = 6.9 \text{ m}$$

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$\tan \theta = \frac{\text{opp}}{\text{adj}}$

Ex.) Solve triangle DEF. Give all sides correct to the nearest tenth and all angles correct to the nearest whole number.

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

$$\sqrt{4.9^2 + 5.3^2} = c$$

$$c = 7.2$$

$$\tan F = \frac{5.3}{4.9}$$

$$\angle F = 47^\circ$$

$$\angle D = 180^\circ - 90^\circ - 47^\circ$$

$$\angle D = 43^\circ$$