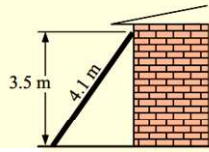


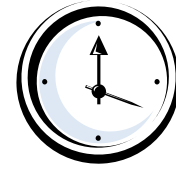
PENERAPAN TRIGONOMETRI

A ladder 4.1 m in length rests against a vertical wall and reaches 3.5 m up from ground level. Find:

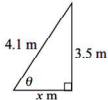
- the angle the ladder makes with the ground
- the distance from the foot of the ladder to the wall using trigonometry.



01



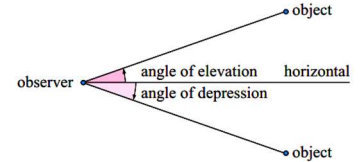
a $\sin \theta = \frac{\text{OPP}}{\text{HYP}} = \frac{3.5}{4.1}$
 $\therefore \theta = \sin^{-1} \left(\frac{3.5}{4.1} \right)$
 $\therefore \theta \approx 58.6^\circ$



b $\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$
 $\therefore \cos 58.61^\circ = \frac{x}{4.1}$
 $\therefore 4.1 \times \cos 58.61^\circ = x$
 $\therefore 2.14 \approx x$

ANGLES OF ELEVATION AND DEPRESSION

The angle between the horizontal and your line of sight is called the **angle of elevation** if you are looking upwards, or the **angle of depression** if you are looking downwards.

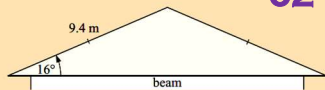


{ **SHIFT** **sin** **(** **3.5** **=** **4.1** **)** **]** **EXE** }

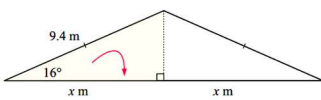
\therefore the ladder makes an angle of about 58.6° with the ground.

\therefore the foot of the ladder is about 2.14 m from the wall.

Determine the length of the horizontal roofing beam required to support a roof of pitch 16° as shown alongside:



02

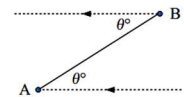


$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$
 $\therefore \cos 16^\circ = \frac{x}{9.4}$
 $\therefore x = 9.4 \times \cos 16^\circ$
 $\therefore x \approx 9.036$

{ **Calculator:** **9.4** **×** **COS** **16** **]** **ENTER** }

\therefore the length of the beam = 2×9.036 m ≈ 18.1 m

If the angle of elevation from A to B is θ° , then the angle of depression from B to A is also θ° .

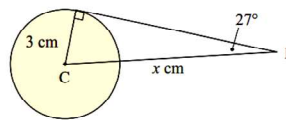


When using trigonometry to solve problems we often use:

- the properties of isosceles and right angled triangles
- the properties of circles and tangents
- angles of elevation and depression.

03

The angle between a tangent from point P to a circle and the line from P to the centre of the circle is 27° . Determine the length of the line from P to the centre of the circle if the radius is 3 cm.



$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$
 $\therefore \sin 27^\circ = \frac{3}{x}$
 $\therefore x = \frac{3}{\sin 27^\circ}$
 $\therefore x \approx 6.61$

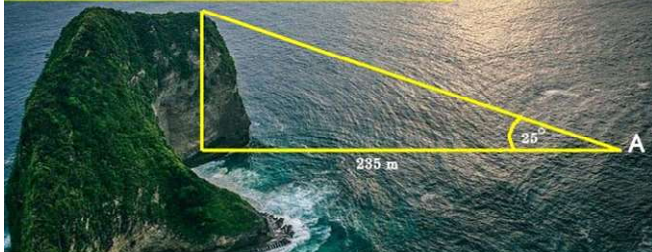
\therefore CP has length approximately 6.61 cm.



TUGAS...!

01

Sebuah tebing diukur dari titik A ke dasar tebing berjarak 235 m. Sudut elevasi 25 derajat. Berapakah tinggi tebing tersebut dari permukaan air laut?



03

Burung Elang dikenal sebagai burung yang memiliki penglihatan yang sangat tajam. Burung ini mampu melihat mangsanya dari jarak yang sangat jauh. Burung Elang mampu melihat mangsanya sejauh 100 kaki/30,48 m di udara. Penglihatannya 8 kali lebih tajam dari penglihatan manusia normal.

Elang mempunyai kecepatan terbang hingga 300 km/jam terutama saat memburu mangsanya. Saat musim migrasi tiba, Elang mampu berpindah tempat ke berbagai belahan dunia



Jika Burung Elang terbang pada ketinggian 100 kaki dari daratan. Kemudian mata Elang melihat mangsa pada sudut depresi 25 derajat, berapa waktu yang dibutuhkan Elang untuk menerkam mangsanya?



02



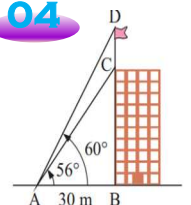
Sudut elevasi yang dibentuk oleh kapal boat sampai ujung bangunan mercusuar adalah 6 derajat, jika tinggi bangunan mercusuar 25 m, berapa jarak kapal boat dengan bangunan mercusuar?



04

From a point A which is 30 m from the base of a building B, the angle of elevation to the top of the building C is 56° , and to the top of the flag pole CD is 60° .

Find the length of the flag pole.



For the circle given, find:

- the radius of the circle
- the distance between A and B.

05

