

Curriculum Outcome

A1 Solve problems that require the manipulation and application of formulas related to: perimeter, area, volume, capacity, the Pythagorean theorem, primary trigonometric ratios, income, currency exchange, interest and finance charges.

G2 Demonstrate an understanding of the Pythagorean theorem by: identifying situations that involve right triangles, verifying the formula, applying the formula, solving problems.

G3 Demonstrate an understanding of primary trigonometric ratios (sine, cosine, tangent) by: applying similarity to right triangles, generalizing patterns from similar right triangles, applying the primary trigonometric ratios, and solving problems.

Student Friendly:



Word Problems

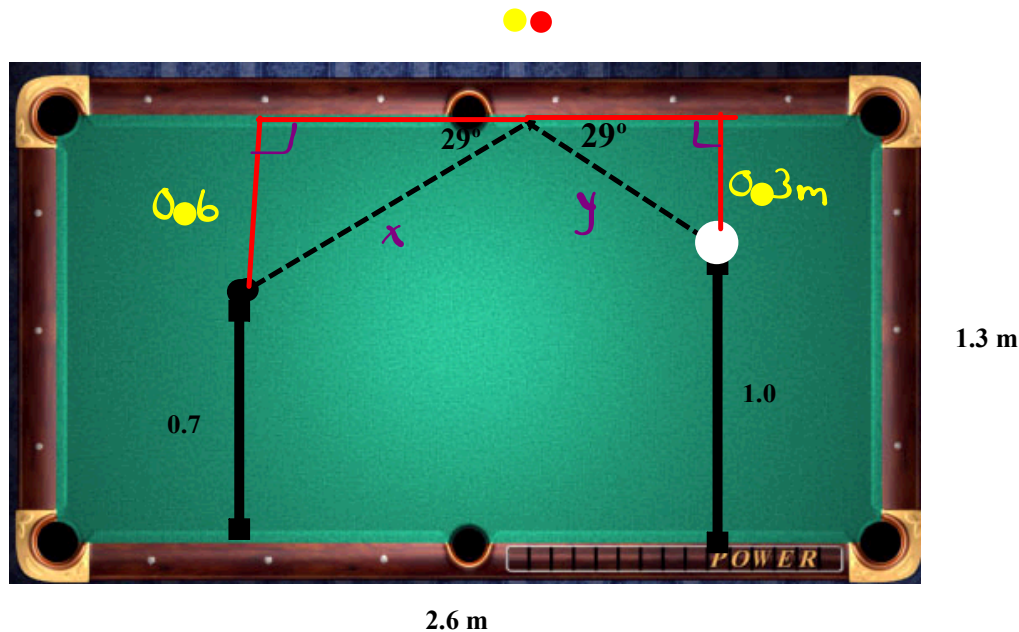


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Soh Cah Toa

15 minute quiz

A pool table is 1.3 m wide and 2.6 m long. A white ball is shot to rebound and hit the black ball. The angle at which the ball hits the side is the same as the rebound angle. The positions of the balls are shown on the diagram below. Use trigonometric ratios to find the distance the white ball traveled by the time it hit the black ball.



$$\begin{aligned} x \\ \sin \theta &= \frac{o}{h} \\ \sin 29^\circ &= \frac{0.6}{x} \end{aligned}$$

$$x = \frac{0.6}{\sin 29^\circ}$$

$$x = 1.24 \text{ m}$$

$$\begin{aligned} y \\ \sin \theta &= \frac{o}{h} \\ \sin 29^\circ &= \frac{0.3}{y} \end{aligned}$$

$$y = \frac{0.3}{\sin 29^\circ}$$

$$y = 0.62$$

$$\begin{aligned} \text{Total} &= 1.24 + 0.62 \\ &= 1.86 \text{ m} \end{aligned}$$

Homework: (see next page also)

1. A television antenna casts a shadow that is 75.0 m long. If the angle of elevation of the sun is 39° , calculate how high above the ground a blackbird perched on the top of the antenna is.
2. From the top of a lighthouse, a hovercraft is sighted at an angle of depression 47° . If the lighthouse is 42.0 m high, how far is the vessel from the lighthouse?
3. A ladder is in an unsafe position if it makes an angle of less than 15° with a wall. A 10.0 m ladder is placed so that its foot is 3.0 m from the wall. Is the ladder standing safely?
4. The face of a cliff rises vertically to a height of 112.0 m. A sighting is made from a yacht to the top of the cliff. The angle of elevation is read as 14° . How far is the yacht from the base of the cliff? Express your answer to 3 significant digits.
5. The Great Pyramid of Cheops is in Giza.
 - (a) If the angle of elevation is 23° , measured 348.0 m from its base, calculate the height of the pyramid to one decimal place.
 - (b) The actual height of the pyramid is 146.6 m. How much does your answer in (a) differ from the actual height? How would you account for the difference?
- * For the following problems, sketch a diagram to summarize the given information.
6. A forest ranger in a tower 128.0 m high sights two fires in the same line of sight with angles of depression 42° and 61° . How far apart are the fires?
7. From a window 26.0 m above the ground, the angle of elevation of the top of a building is 39° , while the angle of depression to the bottom of the building is 29° . How high is the building?
8. A helicopter directly above a building sights a position, A, on the ground at an angle of depression of 38° . The helicopter then rises vertically above the building, a distance of d , in metres, and sights position A, now at an angle of depression of 52° . If position A is 352.0 m from the building, how far has the helicopter risen?
9. The angle of elevation of the top of a building from a point, A, 56.0 m from the building is 58° . A flagpole is on top of the building. The angle of elevation from point A to the top of the flagpole is 62° . What is the length of the flagpole?

Attachments

TrigTheta WS 5.docx

TrigTheta WS 8 (ele dpre).docx

good_grief.wav

TrigTheta WS 7 (word problems).docx