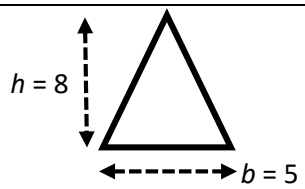
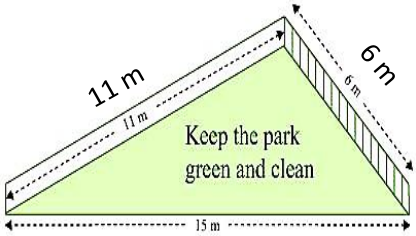
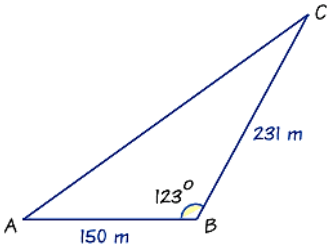
AREA FORMULAS for TRIANGLES

Choose the most appropriate formula based on the information that you are given.

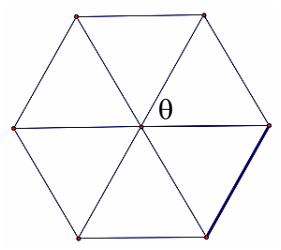
Information		
Base and height (altitude)		**BASIC FORMULA** $\boldsymbol{A = \frac{bh}{2}}$
Three sidelengths	 15 m	**HERON'S FORMULA** $\boldsymbol{A = \sqrt{s(s-a)(s-b)(s-c)}}$
Two sidelengths and an enclosed angle		**SINE FORMULA** $\boldsymbol{A = \frac{1}{2}ac\sin(B)}$

Question

Marcia is planning a garden in her yard. She is using three pieces of wood as a border. The lengths of the pieces of wood are: 4m, 6m and 3m. She wishes to initially cover the garden with a layer of composted soil of height 12 cm. Calculate, correct to the nearest cubic cm, the volume of soil that she will require.

Question

Marcia's friend Alena is planning a more elaborate garden. It will be in the shape of a regular hexagon. The length of each of the six sides will be 1.2 m.



1.2 m

a. Show that the angle θ is equal to 60°

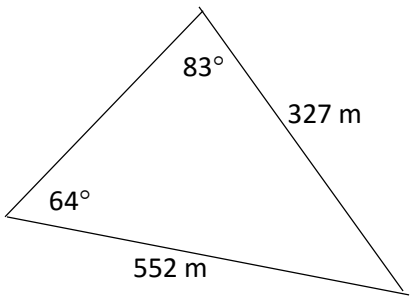
b. Calculate the area of Marcia's garden. Give your answer correct to the nearest square cm.

Question

Matthew is planning to fertilize his lawn. Each bag of fertilizer claims that it can cover 200 square metres of grass. His property is approximately in the shape of a triangle with two sides of length 75 m and 90 m, with an angle in between them of 72°. How many bags of fertilizer will he need to buy?

Question

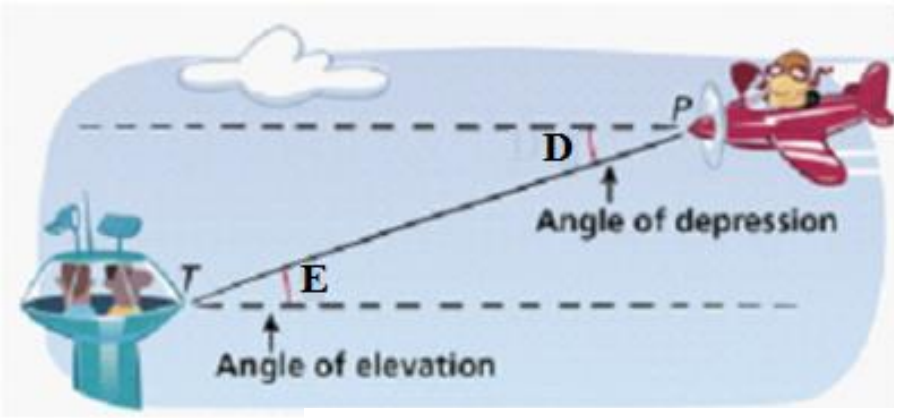
Matthew's friend Jarod has a property with the following shape:



Calculate its area, correct to the nearest square metre.

ANGLES of ELEVATION and DEPRESSION

Are ALWAYS measured relative to the **horizontal**. The angle of elevation from T to P is equal to the angle of depression from P to T (*alternate angles*)

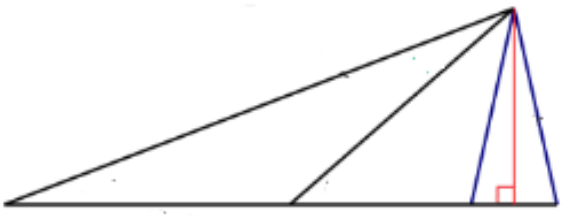


Angle E = Angle D

Question

Caroline wants to measure the height of a vertical radio tower. From some distance away, the angle of elevation from her spot on horizontal ground is 65°. She walks 32 m further away from the tower and then measures the angle of elevation to be 48°.

a. Fill in the relevant information on this diagram.



b. Calculate the height of the radio tower in metres correct to one decimal place.

Questions

1. A person at point A looks due east and spots a UFO with an angle of elevation of 40°. At the same time, another person, 1.2 km due west of A looks due east and sights the same UFO with an angle of elevation of 25°

    a. Draw a diagram to illustrate.

    b. Calculate the height of the UFO, in km correct to two decimal places.

2. The angle of depression from point A on the edge of a river bank to the point X directly in line with it on the edge of the opposite bank is 12°. A tree of height 5 m grows at point A, and from the top of this tree, the angle of depression to point X is 15°.
    a. Draw a diagram to illustrate

    b. Calculate the width of the river, correct to the nearest metre.