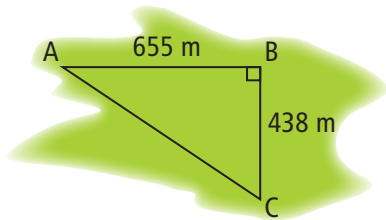


Apply geometric reasoning in solving problems

Online practice assessment task

Question 1

- a. A cross-country running course is in the shape of a right-angled triangle, ABC as shown.

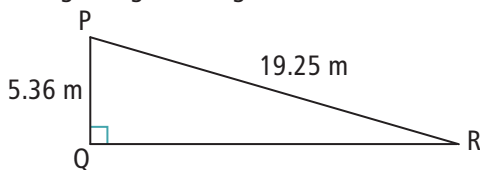


The distance AB is 655 m and the distance BC is 438 m.

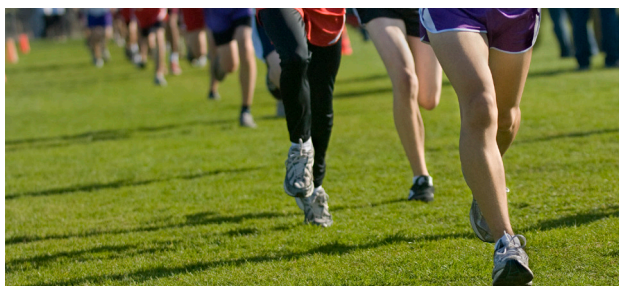
- i. What is the length of AC?

- ii. What is the size of the angle BAC?

- b. The cross-section of a spectator stand is also in the shape of a right-angled triangle, PQR, as shown.

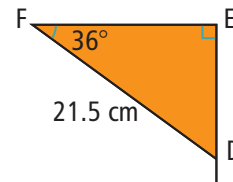


The length PQ is 5.36 m and the length PR is 19.25 m.
Find the length QR.



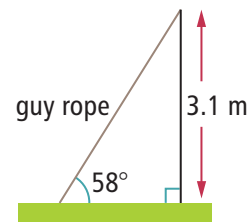
Getty Images - undphtn

- c. A triangular plastic track marker DEF has length DF = 21.5 cm and angle DFE = 36° .



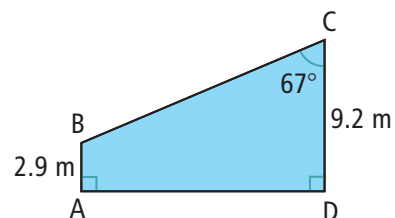
Find the length EF.

- d. A post of height 3.1 m is held up by a guy rope, which makes an angle of 58° with the ground.



What is the length of the guy rope?

- e. The side view of the sports pavilion is shaped as shown below,



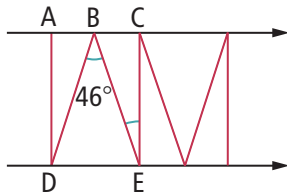
where AB = 2.9 m, CD = 9.2 m and $\angle BCD = 67^\circ$.

Find the length of the roof section, BC.

Question 2

a. Mandy is a jewellery designer. She is designing a series of patterns for rings. The edges of the patterns are parallel.

i. The pattern below is based on the letter M.



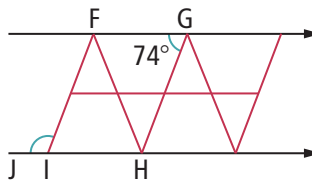
$BD = BE$.

CE is perpendicular to AC.

Angle $DBE = 46^\circ$.

Calculate the size of angle BEC.

ii. The pattern below is based on the letter A.

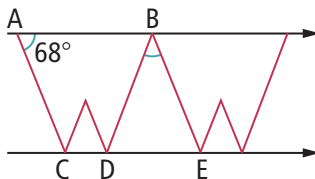


FGHI is a parallelogram.

Angle $FGH = 74^\circ$.

Calculate the size of angle FIJ.

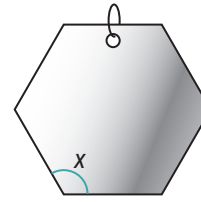
iii. The letter W in the border pattern below has line symmetry.



Angle $BAC = 68^\circ$

Calculate the size of angle DBE.

b. Mandy designs silver earrings in the shape of a regular hexagon.

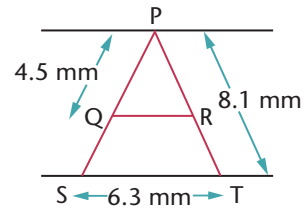


i. Find the size of the angle marked x . Give reasons.

Mandy cuts out her earrings from a sheet of silver.

ii. Give a practical reason for her choice of polygon.

c. The letter A in Mandy's design is symmetrical and has dimensions as shown.



$PQ = 4.5$ mm.

$PT = 8.1$ mm.

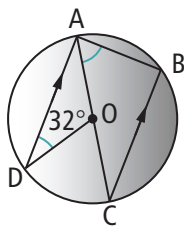
$ST = 6.3$ mm.

Calculate the length of QR.

You must give a geometric reason for each step leading to your answer.

Question 3

a. Aroha designs circular earrings with geometric designs.



AC is the diameter of the circle, centre O.

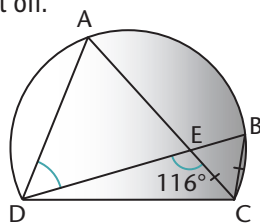
Angle ADO = 32° .

AD is parallel to BC.

Calculate the size of angle BAC.

You must give a geometric reason for each step leading to your answer.

b. Aroha's new brooch design is in the shape of a circle with a segment cut off.



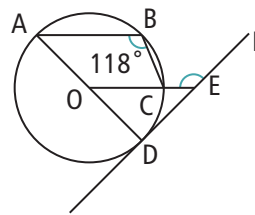
Angle DEC = 116° .

EC = BC.

Calculate the size of angle ADE.

You must give a geometric reason for each step leading to your answer.

c. In the figure below, AD is a diameter of a circle centre O. DF is a tangent to the circle at D.



Angle ABC = 118° .

Calculate angle CEF.

You must give a geometric reason for each step leading to your answer.



Getty Images – Alexandre Shimoshvili

