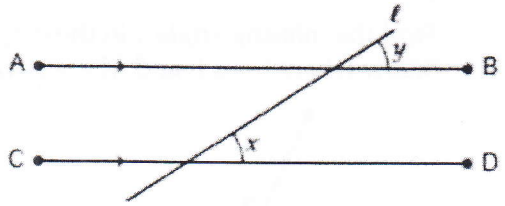
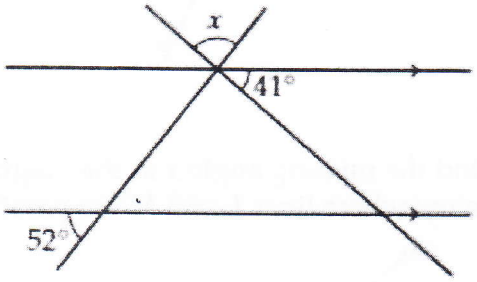
Triangles

Angles

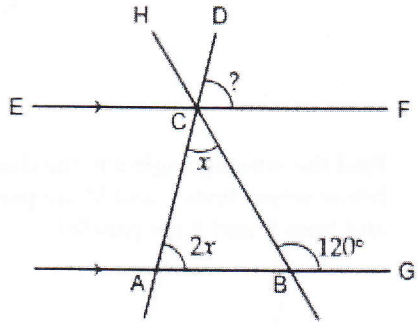
1. What type of angles is $\angle x$ and $\angle y$?



2. Find the value of $\angle x$ in the following diagram.

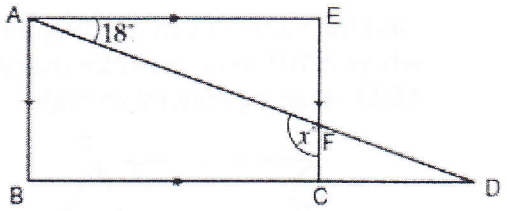


3. Find the measure of $\angle DCF$ in the following diagram.



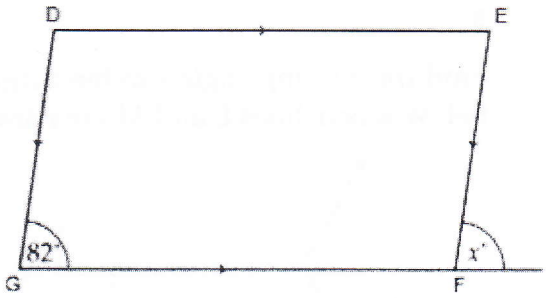
7. Find the value of x in the diagram on the right,

4.
Find the value of x in the diagram below where $ABCE$ is a rectangle.



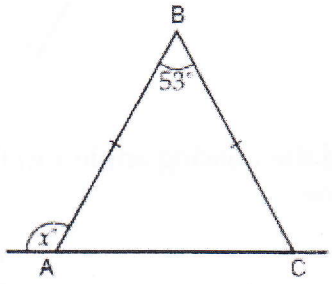
5.

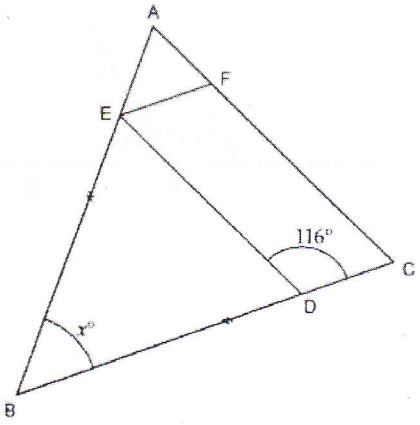
Find the value of x in the diagram below where DE is parallel to GF and GD is parallel to EF.



6.

Find the value of x in the diagram below where AB and BC are equal in length.



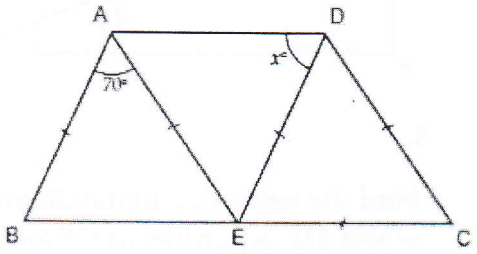


Triangles

Give the geometric statements to justify your answer in the questions below.

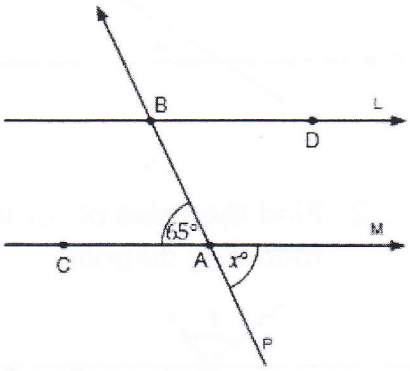
1. Where AB and BC are equal in length and CFED is a parallelogram

Find the value of x in the diagram below where ΔABE is an isosceles triangle and ΔDEC is an equilateral triangle.



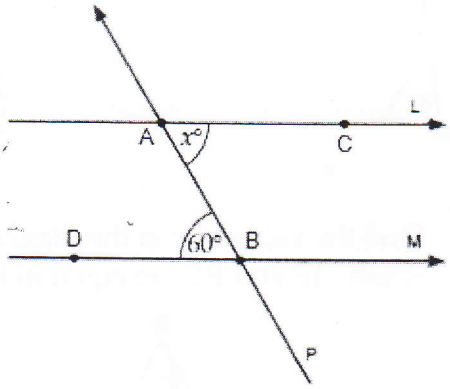
2

Find the missing angle x in the diagram below where lines L and M are parallel.



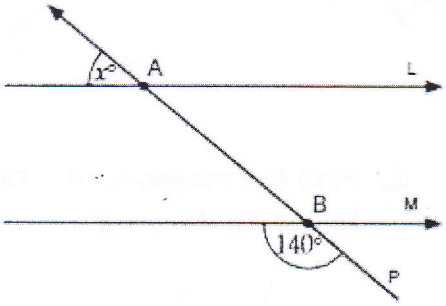
3

Find the missing angle x in the diagram below where lines L and M are parallel.



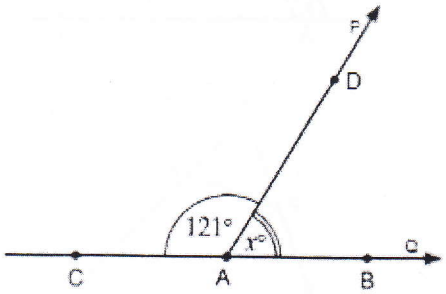
4.

Find the missing angle x in the diagram below where lines L and M are parallel.



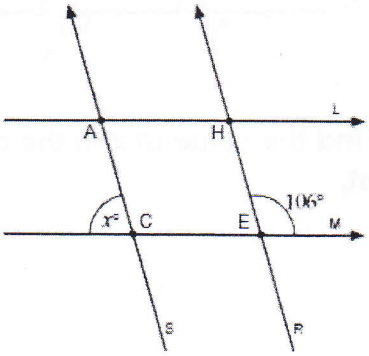
5.

Find the missing angle x in the diagram below.



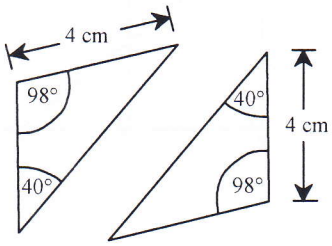
6.

Find the missing angle x in the diagram below where lines L and M are parallel and lines R and S are parallel.

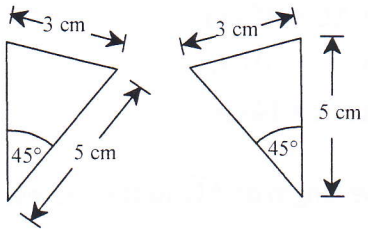


1. Which of the four pairs of triangles below consists of two triangles that are definitely congruent? What geometric statement can be used to justify your answer.

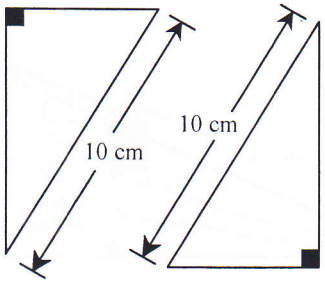
A)



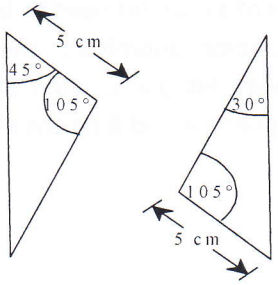
C)



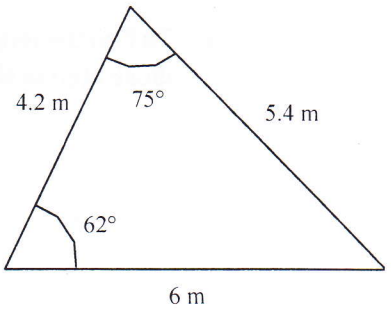
B)



D)

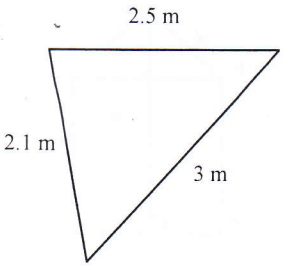


2. The designer for a shipping company has to reproduce models of sails similar to the one on the right.

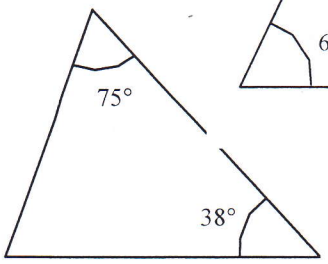


According to the given information, which one is similar to the original model?

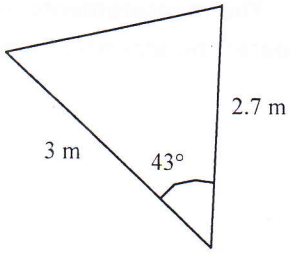
A)



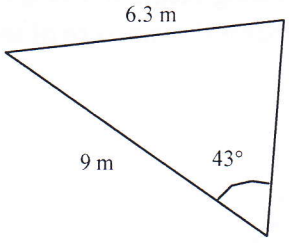
C)



B)



D)



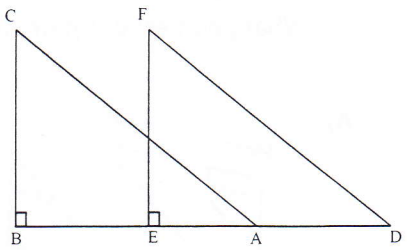
Find the missing measures

1. Right triangles ABC and DEF are isometric (congruent).

   $m\overline{AC} = 40\text{ cm}$

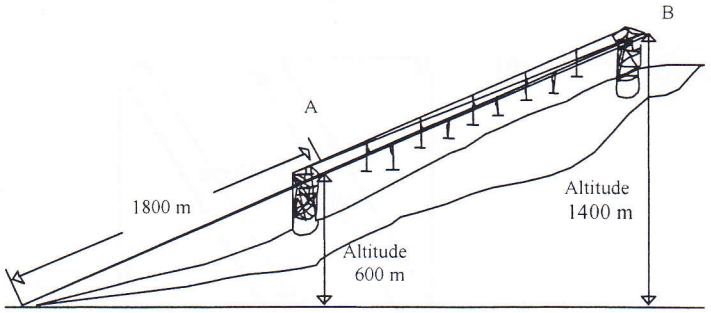
   $m\overline{EF} = 20\text{ cm}$

   $m\overline{EA} = 14\text{ cm}$

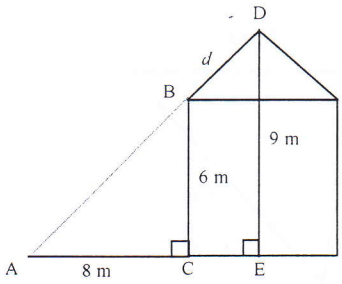


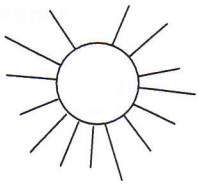
What is the length of $\overline{AD}$ to the nearest tenth?

2. The cables of a chair lift need to be replaced. The contractor submitted the following drawing with his plans. Find the distance between points A and B on the chair lift.

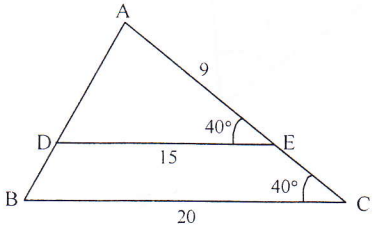


3. To find the length *d* of the roof of a warehouse that is to be repaired, John uses the measurements illustrated in the diagram below. Find the length *d.*

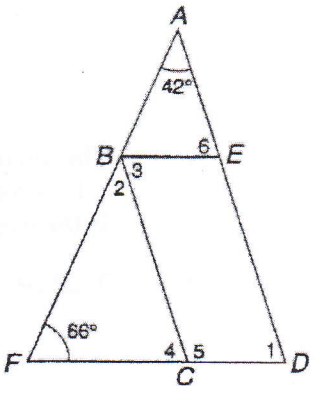




4. In the following diagram, triangles ABC and ADE are similar. The measurements are given in metres. What is the measure of segment EC, rounded to the nearest hundredth of a metre?

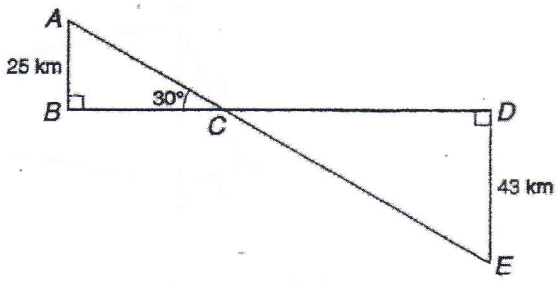


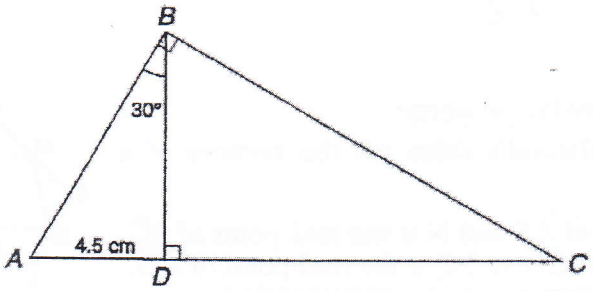
1. In the figure, *ABCD* is a trapezoid and *BCDE* is a parallelogram. **What are the measures of angles 1 to 6?**



2. In a triangle, the bisector of an angle divides the side opposite the angle into two congruent segments. Show that this conjecture is false using a counterexample.

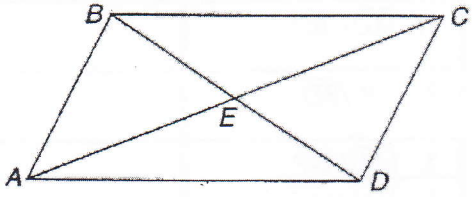
3. **How far apart are points *A* and *E*?**



4. 

What is the length of the hypotenuse of triangle *ABC*?

5. $\overline{AC}$ and $\overline{BD}$ are the diagonals of parallelogram *ABCD*. Prove that:



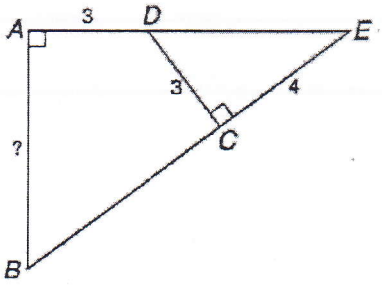
a) $\Delta ABC \cong \Delta CAD$

b) $\Delta BEA \cong \Delta CED$

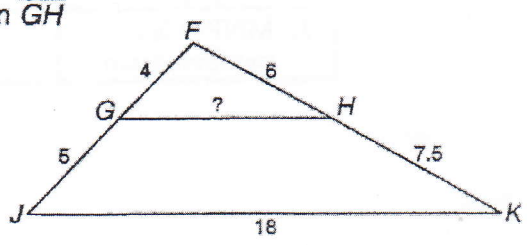
c) $\Delta BEC \cong \Delta AED$

6. Give the minimum conditions that prove that he triangles are similar and calculate the missing measures.

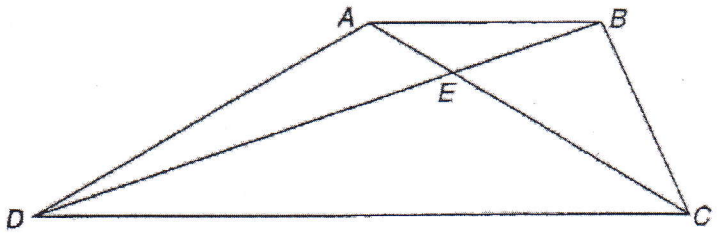
a) m $\overline{AB}$



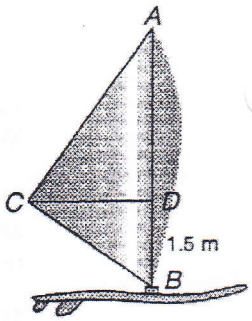
b) m $\overline{GH}$



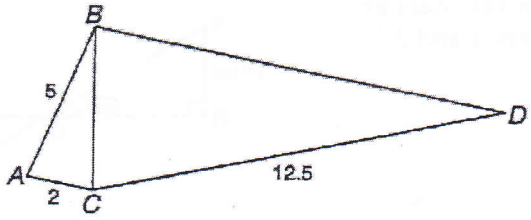
7. Given that *ABCD* is a trapezoid, prove that $\triangle ABE \sim \triangle CDE$.



8. The sail on a sailboard is in the shape of a right triangle. The wishbone ($\overline{CD}$) is 2.12 *m* long and is attached perpendicularly to the mast, 1.5 *m* from its base. **What is the length of the mast?**

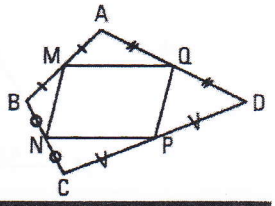


9. Triangles *ABC* and *BCD* are isosceles. Prove that $\triangle ABC \sim \triangle BCD$.



10. Justify the steps proving the following property:

"The mid-points of any quadrilateral's sides are the vertices of a parallelogram".

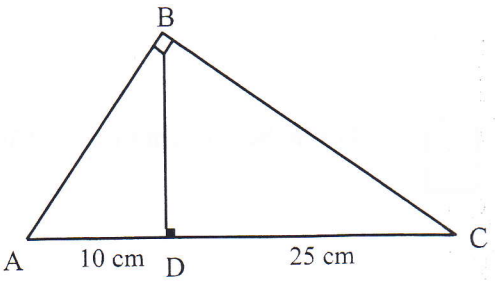


Hypothesis: M is the mid-point of $\overline{AB}$ and N is the mid-point of $\overline{BC}$.
P is the mid-point of $\overline{CD}$ and Q is the mid-point of $\overline{AD}$.

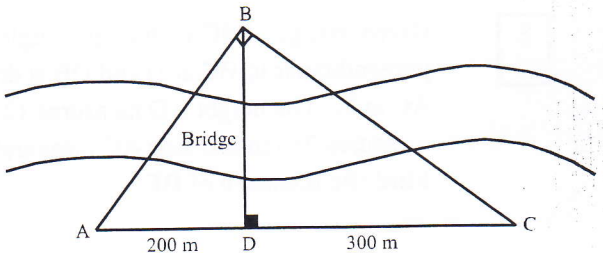
Statement	Justification
1. $\overline{MQ}//\overline{BD}$	
2. $\overline{NP}//\overline{BD}$	
3. $\overline{MQ}//\overline{NP}$	
4. $\overline{MN}//\overline{AC}$	
5. $\overline{QP}//\overline{AC}$	
6. $\overline{MN}//\overline{QP}$	
7. MNPQ is a parallelogram.	

Metric Relations

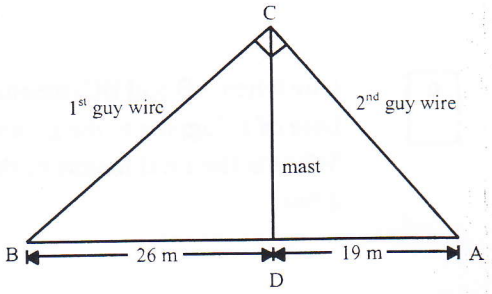
1 ABC is a right triangle in which segment AD measures 10 cm and segment DC, 25 cm. **What is the measure of segment AB?**



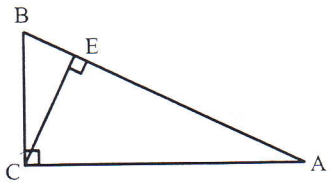
2 A land surveyor wants to know the length of the bridge that is to be built across a river. The measures are shown in the diagram. **What is the length BD of the bridge?**



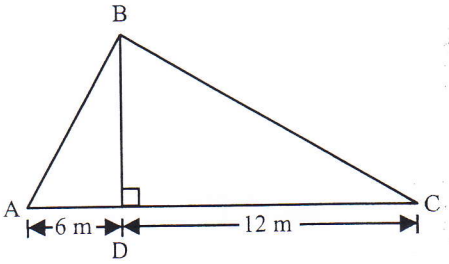
3 The mast of a sail is secured with two guy wires as shown in the adjacent figure. The angle formed at the point where the 2 guy wires are attached to the top of the mast is 90°. The 1st guy wire is attached to the deck 26 m from the foot of the mast. The 2nd guy wire is attached 19 m from the foot of the mast at the opposite end of the deck. During a storm, the 1st guy wire broke.
What length of cable is needed to replace it?



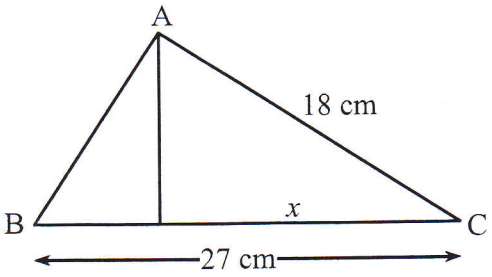
4 In the figure to the right, triangle ABC is right-angled at C and $\overline{CE}$ is an altitude.
m $\overline{AB}$ = 15 cm and m $\overline{AC}$ = 12 cm.
What is the length of the altitude CE?



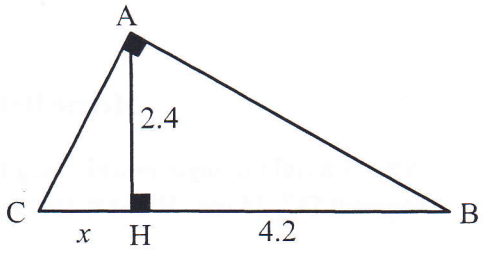
5 Right triangle ABC represents the framework of the roof of a sugar shack.
What are the lengths of the sides AB and BC?



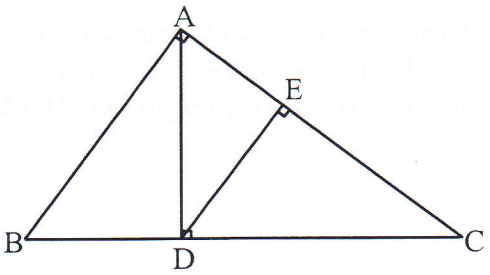
6 Given triangle ABC, right angled at A, with an altitude drawn to the hypotenuse. **Determine the value of *x*.**



7 Given the adjacent triangle BAC. **Determine the value of x.**



8 Given triangle ABC with a right angle at A. AD is drawn perpendicular to BC at D and DE is drawn perpendicular to AC at E. The height AD measures 12 cm, hypotenuse BC measures 25 cm and side AC measures 20 cm.
Find the measure of DE.



9 Guy wires AB and BC, measuring 13 m and 9 m respectively, anchor the base of a flagpole to the ground. The angle formed by the guy wires is 90°.
What is the total height of the flagpole if the portion above the wires is 2.5*m*?