

SHARP

Worksheet 8: Trigonometry

Grade 11 Mathematics

1. Prove the following:

a) the cos rule

b) the sine rule

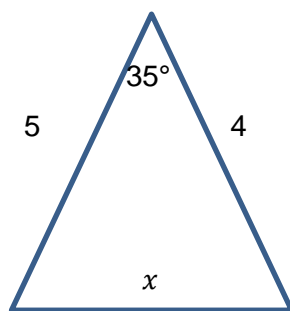
c) the area rule

(R)

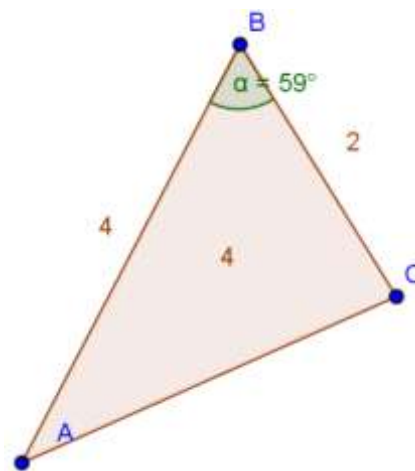
2. Using the cos rule, find the missing side:

(R)

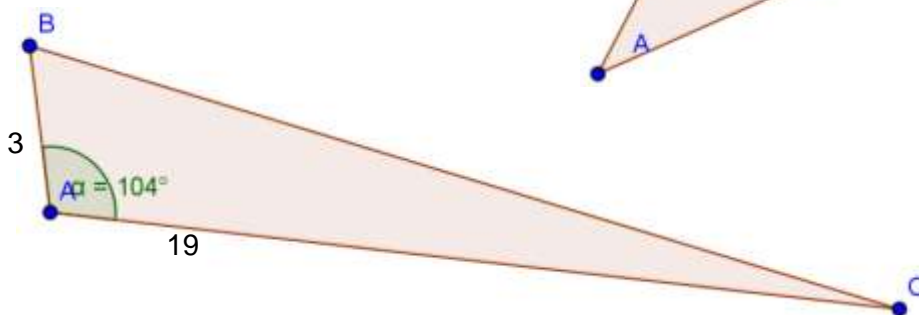
a)



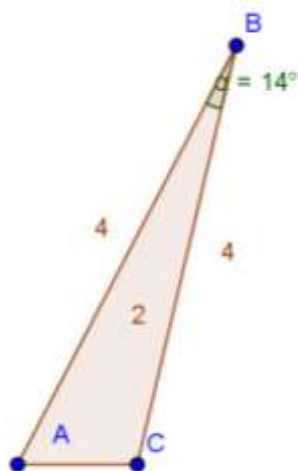
b)



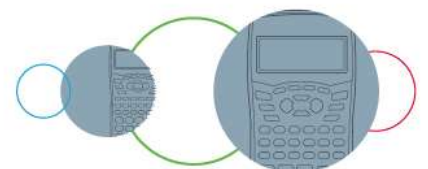
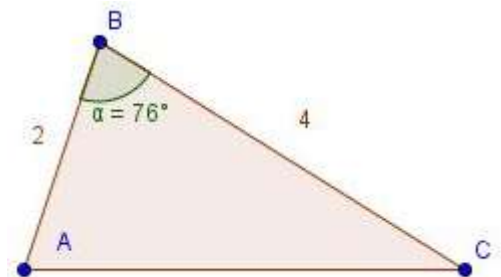
c)



d)



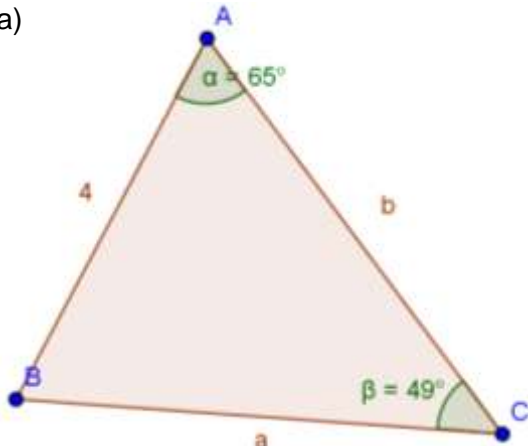
e)



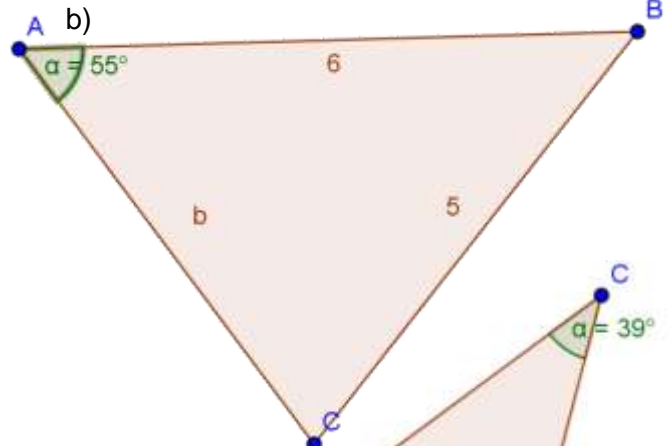
3. Using the sine rule, determine the missing values for the triangle:

(R)

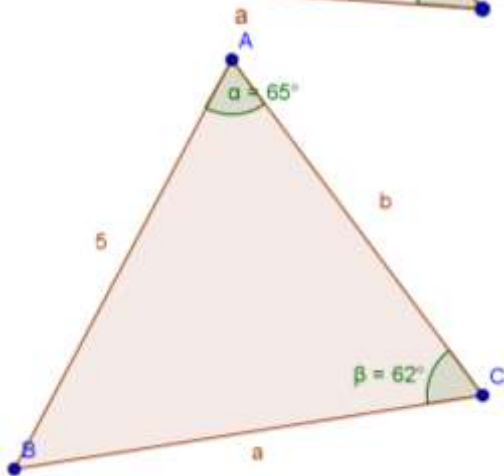
a)



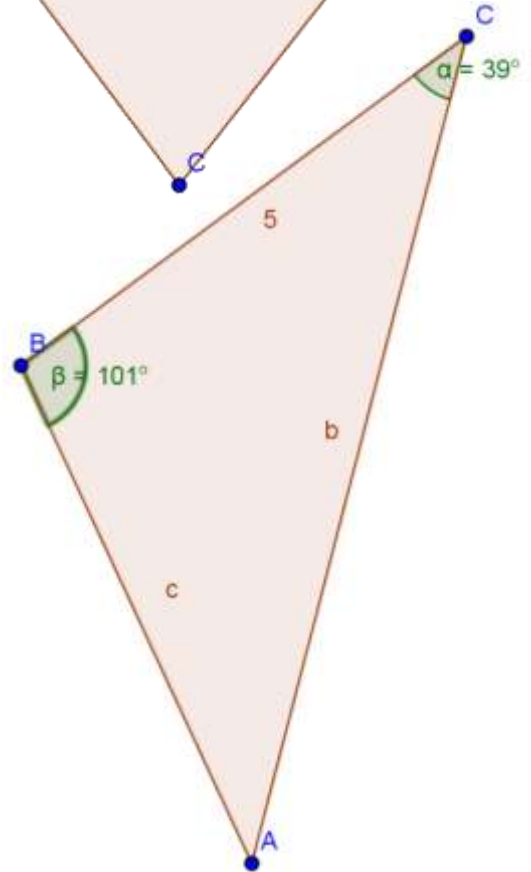
b)



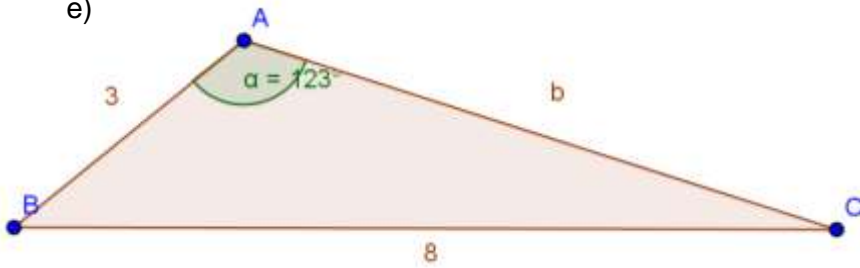
c)



d)



e)



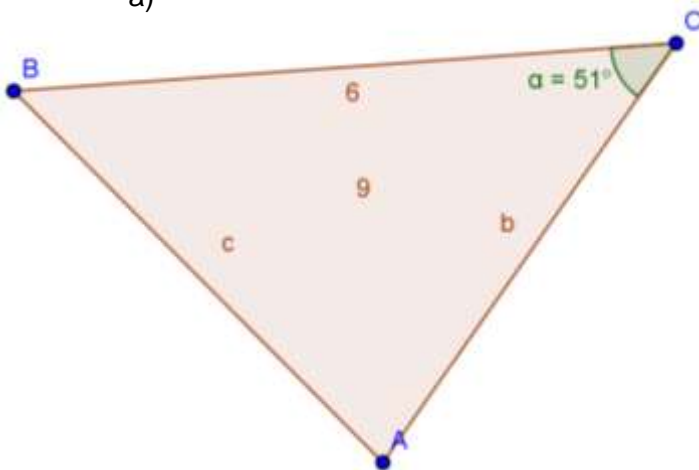
4. Find the area for each of the triangles in question 2 and 3.

(R)

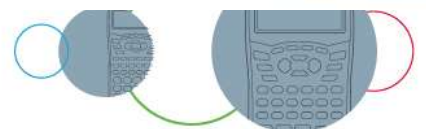
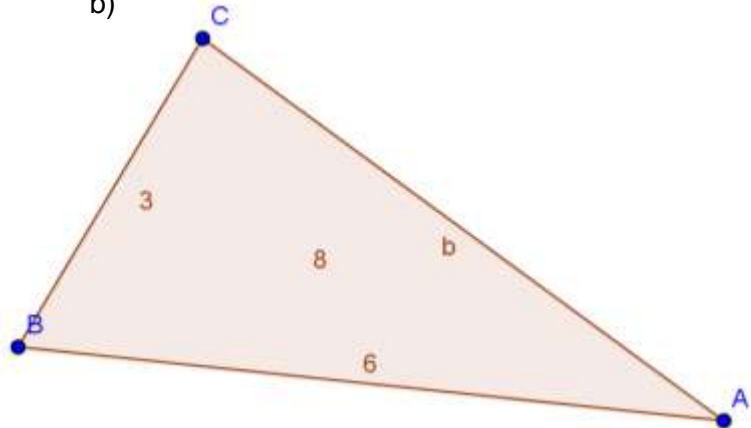
5. Given the area for the triangle, determine the missing values.

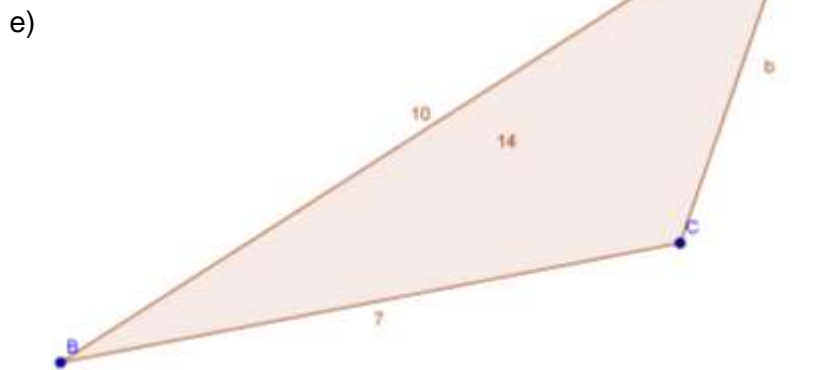
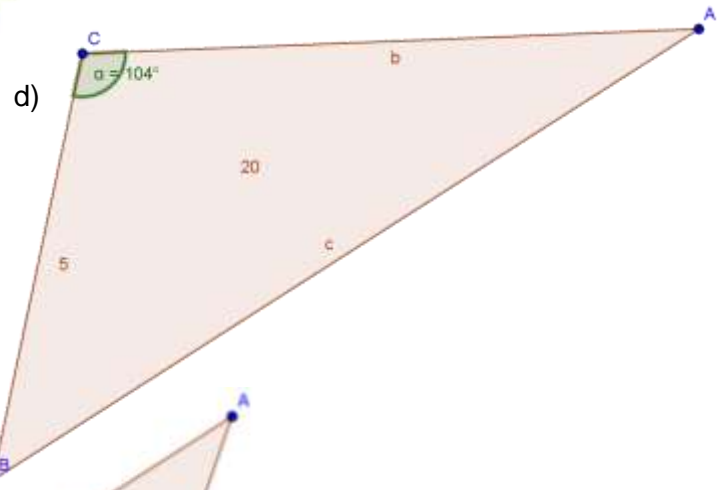
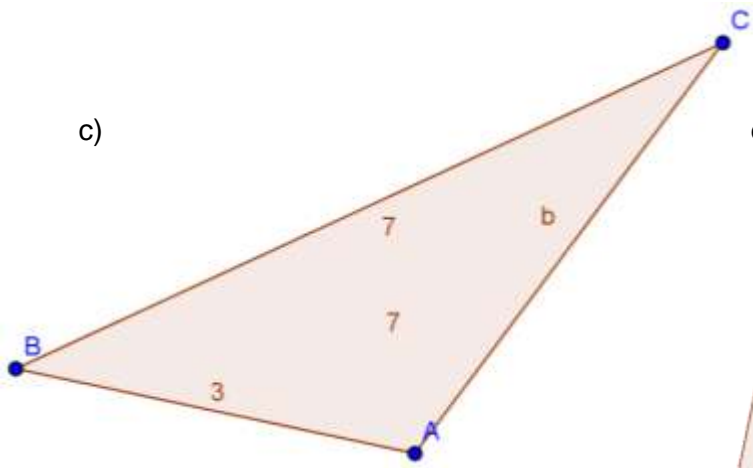
(C)

a)

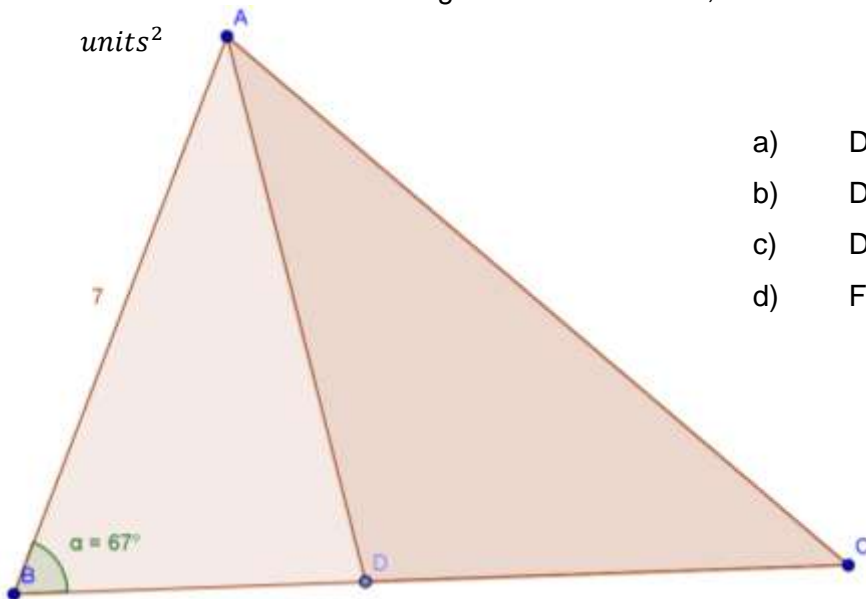


b)



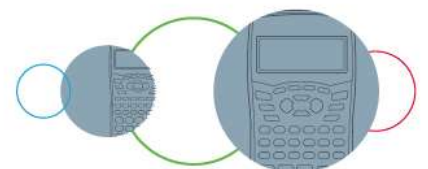


6. Given that the area for triangle ABC is 28 units^2 , and that the area of triangle ADC is 16 units^2

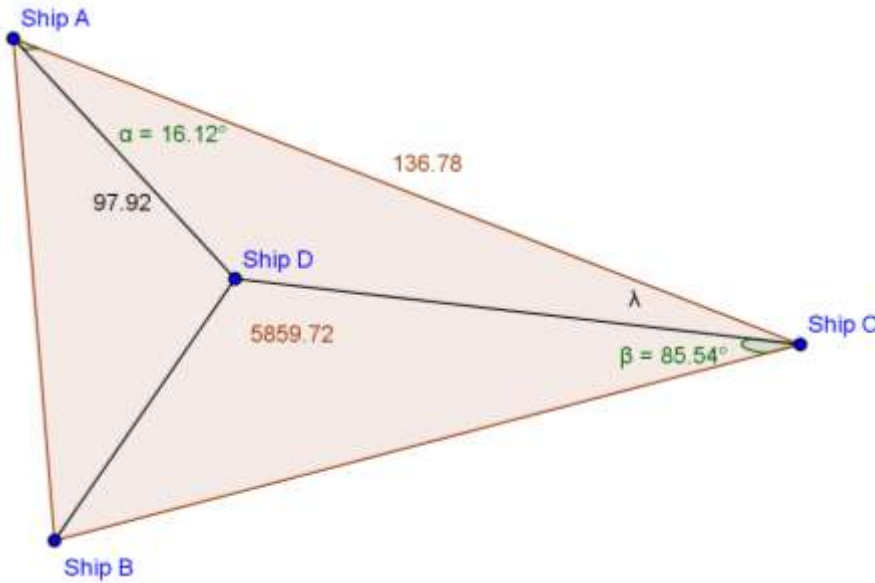


- Determine the value of AD. (P)
- Determine the value of AC. (P)
- Determine the value of DC. (R)
- Find the value of angle \widehat{ADC} . (C)

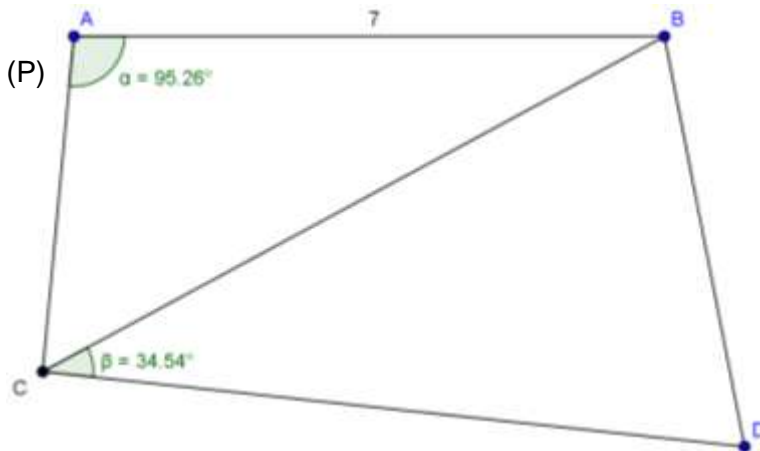
7. Given a triangle, MNP with side $MN = NP$ and $MP = \frac{1}{3}MN$, determine the size of the angles in triangle MNP. (P)



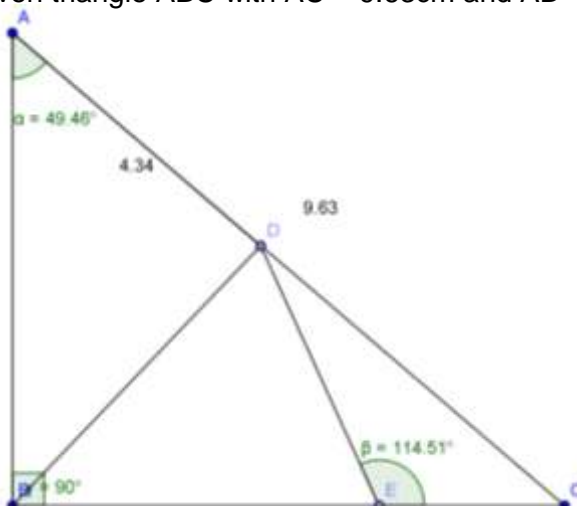
8. Given below is a diagram of 4 ships in the middle of the ocean. The distance between ship A and ship C is 136,78km and the angle made from ship D to A and then to C is $\alpha = 16.12^\circ$. The angle made from ship D to C and then to B is $\beta = 85.54^\circ$. The distance from ship A to ship D is 97.92km and the total area covered between ships A, B and C is $5859,72\text{km}^2$. If ship D is in distress, determine which ship will reach Ship D first? (Note that the diagram is not drawn to scale). (P)



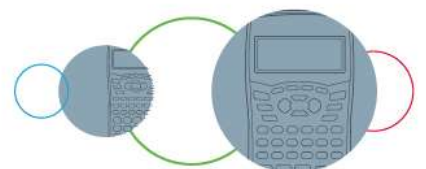
9. Given the quadrilateral ABDC below, with $AB = 7$, $BC = CD$, $AC = x$ and $BD = \frac{5}{4}AC$. Determine the values of BC and x . (P)



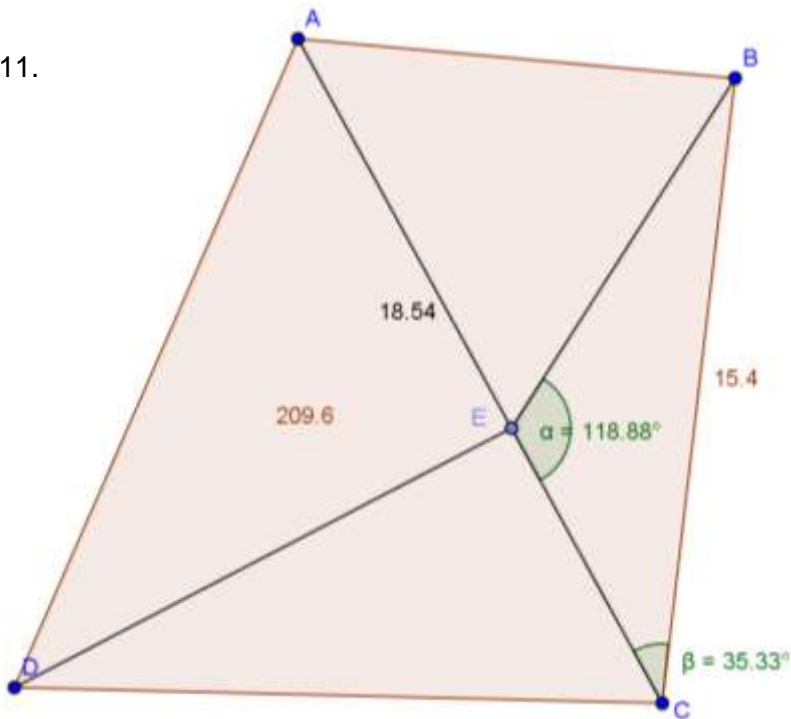
10. Given triangle ABC with $AC = 9.63\text{cm}$ and $AD = 4.34\text{cm}$. $B\hat{A}D = 49.46^\circ$ and $D\hat{E}C = 114.51^\circ$.



- Determine the value of AB. (R)
- Determine the value of BD. (C)
- Determine the value of BC. (C)
- Determine the value of ED. (P)
- Determine the value of BE. (P)
- Determine the area of $\triangle BDE$. (P)



11.

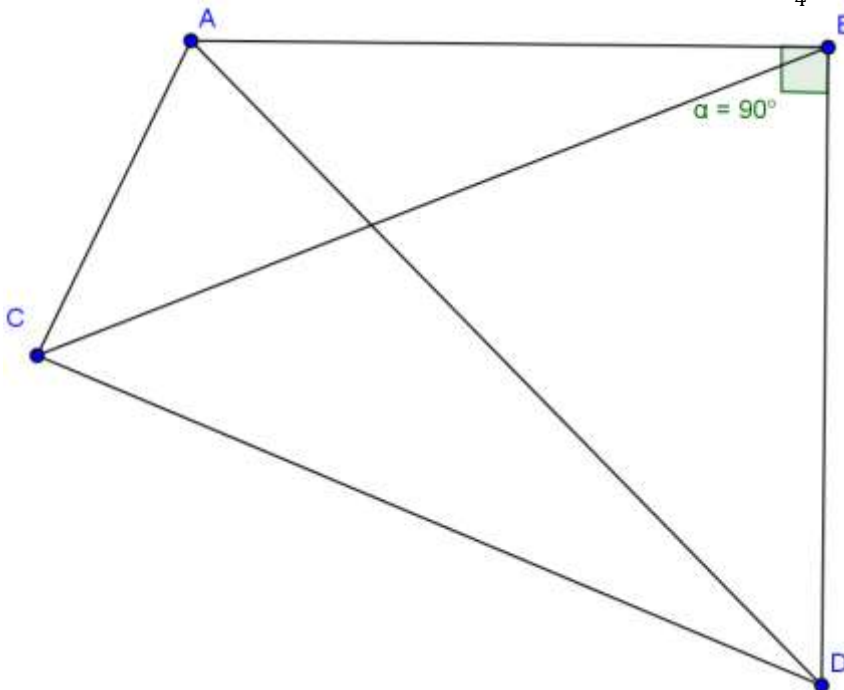


Given the quadrilateral ABCD with point E connected to each vertex. AEC is a straight line with a length of 18.54m. The total area of the quadrilateral is 209.6m².

$$E\hat{C}B = 35.33^\circ.$$

- a) Determine the value of EC. (C)
- b) Determine the value of AB. (R)
- c) Determine the value of $A\hat{B}C$. (C)
- d) Given that DE = 13.7m and AD = 17.32m, find:
 - i) $A\hat{E}D$ (C)
 - ii) The area of ΔEDC (P)
 - iii) And hence the value of DC. (P)

12. Given the quadrilateral ABDC below with $AB = BD = \frac{3}{4}x$ and $CB = CD = x$.



- a) Determine the value of AD in terms of x . (C)
- b) Determine the value of $B\hat{C}D$. (P)

