



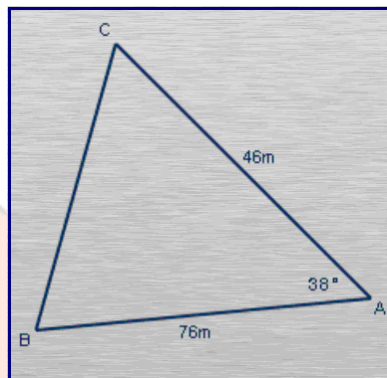
CAMI Mathematics: Grade 11

GRADE 11_Sine, cosine and area rule

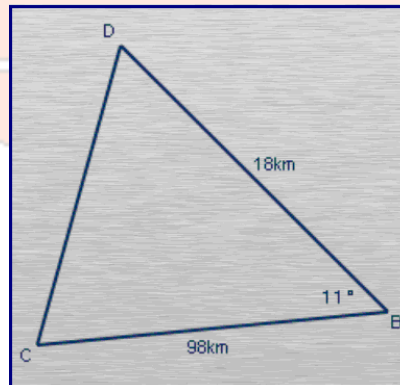
11.7 Area rule

1. Area rule

(a) Calculate the area of $\triangle ABC$.



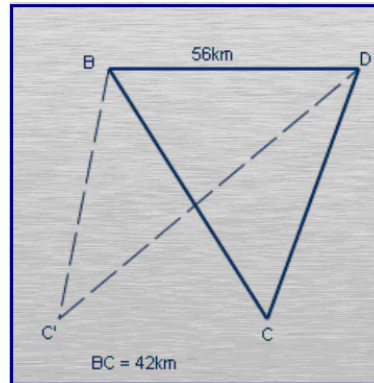
(b) Calculate the area of $\triangle BCD$





CAMI Mathematics: Grade 11

- (c) Calculate the possible sizes of \hat{B} if the area of $\triangle BCD = 149 \text{ km}^2$.



- (d) Calculate the area of $\triangle FGH$ if $\tan \hat{F} = 3.271$, $FG = 82 \text{ cm}$ and $FH = 83 \text{ cm}$.
- (e) Calculate side DE of $\triangle DEF$ with area = 623 m^2 , $DF = 28 \text{ m}$ and $\hat{D} = 63^\circ$



CAMI Mathematics: Grade 11

MEMO

(Answers correct to two decimal places)

1. Area Rule [7.7.2.1; 7.7.2.2]

$$\begin{aligned} \text{(a) Area } \triangle ABC &= \frac{1}{2} AB \times AC \times \sin \hat{A} \\ &= \frac{1}{2} (76)(46)\sin 38^\circ \\ &= 1076.18 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{(b) Area } \triangle ABC &= \frac{1}{2} BC \times BD \times \sin \hat{B} \\ &= \frac{1}{2} (98)(18)\sin 11^\circ \\ &= 168.29 \text{ km}^2 \end{aligned}$$

$$\begin{aligned} \text{(c)} \quad \sin \hat{B} &= \frac{2 \times \text{area}}{BC \cdot BD} \\ \sin \hat{B} &= \frac{2 \times 149}{(42)(56)} \\ \sin \hat{B} &= 0.12670068 \\ \therefore \hat{B} &= 7.28^\circ \\ \text{or} \\ \hat{B} &= 172.72^\circ \end{aligned}$$

(d) Calculate the area of $\triangle FGH$ if $\tan \hat{F} = 3.271$, $FG = 82$ cm and $FH = 83$ cm.

$$\tan \hat{F} = 3.271$$

$$\therefore \hat{F} = 73^\circ$$



CAMI Mathematics: Grade 11

$$\text{Area}\Delta FGH = \frac{1}{2} \times FG \times FH \times \sin \hat{F}$$

$$\text{Area}\Delta FGH = \frac{1}{2} \times 82 \times 83 \times \sin 73^\circ$$

$$\text{Area}\Delta FGH = 3254.31\text{cm}^2$$

(e) Calculate side DE of ΔDEF with area = 623 m², DF = 28 m and $\hat{D} = 63^\circ$

$$DE = \frac{2 \times \text{area}}{DF \times \sin \hat{D}}$$

$$DE = \frac{2 \times 623}{28 \times \sin 63^\circ}$$

$$DE = 49.94\text{m}$$

