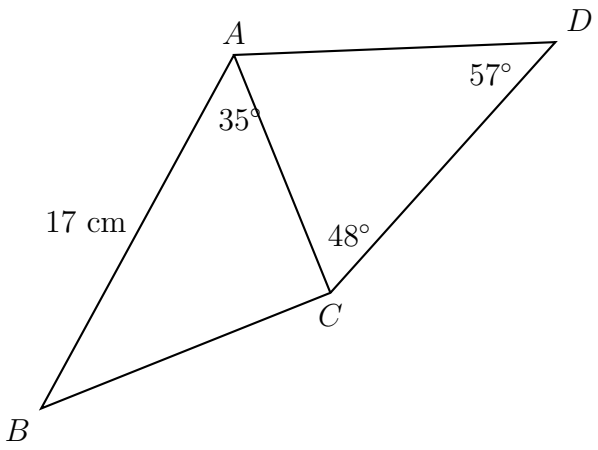
Non-Right-Angled Trigonometry Practice

Based on Edexcel 1MA1 / June 2024 / Paper 3H / Q18

Question 1

$ABCD$ is a quadrilateral.



The area of triangle ABC is 54 cm^2.

Calculate the area of triangle ACD.

Give your answer correct to 3 significant figures.

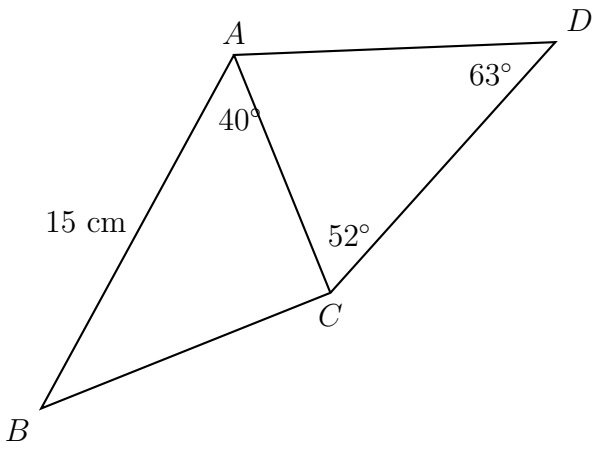
(Total for Question 1 is 5 marks)

Non-Right-Angled Trigonometry Practice

Based on Edexcel 1MA1 / June 2024 / Paper 3H / Q18

Question 2

$ABCD$ is a quadrilateral.



The area of triangle ABC is 60 cm^2.

Calculate the area of triangle ACD.

Give your answer correct to 3 significant figures.

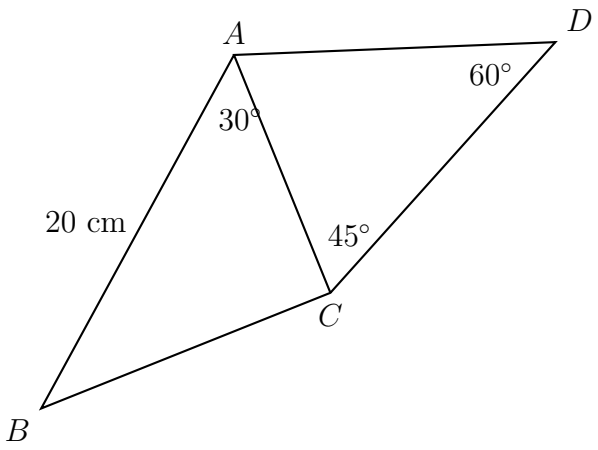
(Total for Question 2 is 5 marks)

Non-Right-Angled Trigonometry Practice

Based on Edexcel 1MA1 / June 2024 / Paper 3H / Q18

Question 3

$ABCD$ is a quadrilateral.



The area of triangle ABC is 75 cm^2.

Calculate the area of triangle ACD.

Give your answer correct to 3 significant figures.

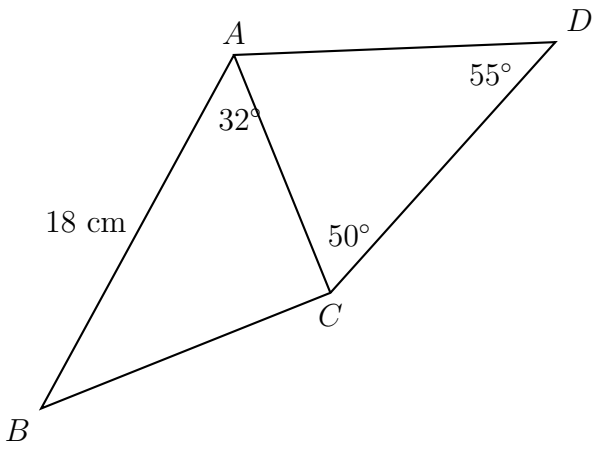
(Total for Question 3 is 5 marks)

Non-Right-Angled Trigonometry Practice

Based on Edexcel 1MA1 / June 2024 / Paper 3H / Q18

Question 4

$ABCD$ is a quadrilateral.



The area of triangle ABC is 68 cm^2.

Calculate the area of triangle ACD.

Give your answer correct to 3 significant figures.

(Total for Question 4 is 5 marks)

Model Answers & Human-Written Solutions

Trigonometry & Triangle Area Practice

Question 1

1. **Find the shared length AC using triangle ABC:**

$$\text{Area} = \frac{1}{2} \times AB \times AC \times \sin(\angle BAC)$$

$$54 = \frac{1}{2} \times 17 \times AC \times \sin(35^\circ)$$

$$54 = 8.5 \times AC \times \sin(35^\circ)$$

$$AC = \frac{54}{8.5 \times \sin(35^\circ)} \approx 11.0747 \text{ cm}$$

2. **Find the third angle in triangle ACD:**

$$\angle CAD = 180^\circ - (48^\circ + 57^\circ) = 75^\circ$$

3. **Use the Sine Rule to find side CD:**

$$\frac{CD}{\sin(\angle CAD)} = \frac{AC}{\sin(\angle ADC)}$$

$$\frac{CD}{\sin(75^\circ)} = \frac{11.0747}{\sin(57^\circ)} \implies CD = \frac{11.0747 \times \sin(75^\circ)}{\sin(57^\circ)} \approx 12.7516 \text{ cm}$$

4. **Calculate the Area of triangle ACD:**

$$\text{Area} = \frac{1}{2} \times AC \times CD \times \sin(\angle ACD)$$

$$\text{Area} = \frac{1}{2} \times 11.0747 \times 12.7516 \times \sin(48^\circ) \approx 52.5 \text{ cm}^2 \text{ (to 3 s.f.)}$$

Question 2

1. $AC = \frac{2 \times 60}{15 \times \sin(40^\circ)} \approx 12.4458$ cm.
2. $\angle CAD = 180^\circ - (52^\circ + 63^\circ) = 65^\circ$.
3. $CD = \frac{12.4458 \times \sin(65^\circ)}{\sin(63^\circ)} \approx 12.6657$ cm.
4. Area $= \frac{1}{2} \times 12.4458 \times 12.6657 \times \sin(52^\circ) \approx 62.1$ cm^2 (to 3 s.f.).

Question 3

1. $AC = \frac{2\times 75}{20\times \sin(30^\circ)} = 15.0$ cm.
2. $\angle CAD = 180^\circ - (45^\circ + 60^\circ) = 75^\circ$.
3. $CD = \frac{15.0\times \sin(75^\circ)}{\sin(60^\circ)} \approx 16.7303$ cm.
4. Area $= \frac{1}{2} \times 15.0 \times 16.7303 \times \sin(45^\circ) \approx 88.7$ cm^2 (to 3 s.f.).

Question 4

1. $AC = \frac{2\times 68}{18\times \sin(32^\circ)} \approx 14.2575$ cm.
2. $\angle CAD = 180^\circ - (50^\circ + 55^\circ) = 75^\circ$.
3. $CD = \frac{14.2575\times \sin(75^\circ)}{\sin(55^\circ)} \approx 16.8142$ cm.
4. Area $= \frac{1}{2} \times 14.2575 \times 16.8142 \times \sin(50^\circ) \approx 91.8$ cm^2 (to 3 s.f.).