



JP Maths

Revision



Attempt the paper
before watching the
solutions!

[https://www.youtube.com/
@JPMathsRevision](https://www.youtube.com/@JPMathsRevision)



HIGHER

≡ Solutions ≡

Area of a triangle using $A = \frac{1}{2}ab\sin(C)$



SOLUTIONS GUIDE

- Compare your **method** as well as your final answer.
- Check where **marks** would be awarded.
- If you got stuck, **try the question again** before reading the full solution.
- **Alternative** correct methods may be shown.



MARKING INFORMATION

- **Method marks** may be awarded even if the final answer is incorrect.
- **Alternative valid methods** may exist.
- Answers are given to the **accuracy** stated in each question.

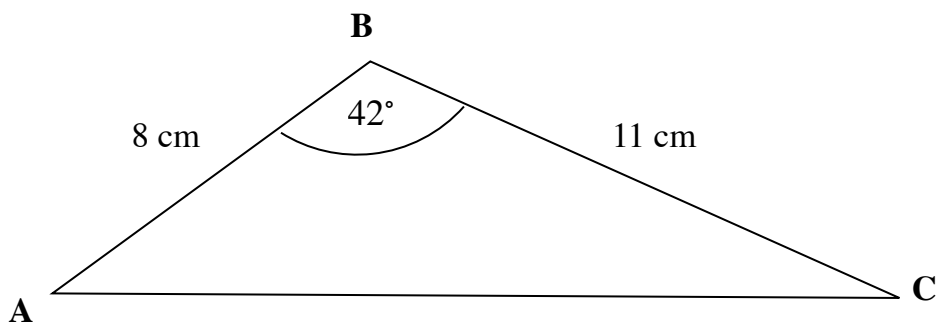


HELPFUL ADVICE

- **Review** any questions you found challenging.
- Make **notes** on any topics to revisit.
- **Practice** similar questions to build confidence.



1. Calculate the area of triangle ABC.

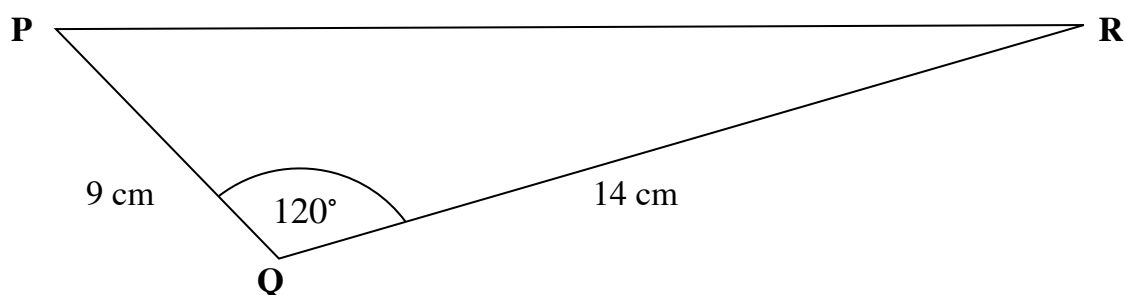


$$A = \frac{1}{2} (8)(11) \sin 42$$
$$= 29.4$$

29.4 cm²

.....
(Total for Question 1 is 2 marks)

2. Calculate the area of triangle PQR.



$$A = \frac{1}{2} (9)(14) \sin (120)$$
$$= 54.6$$

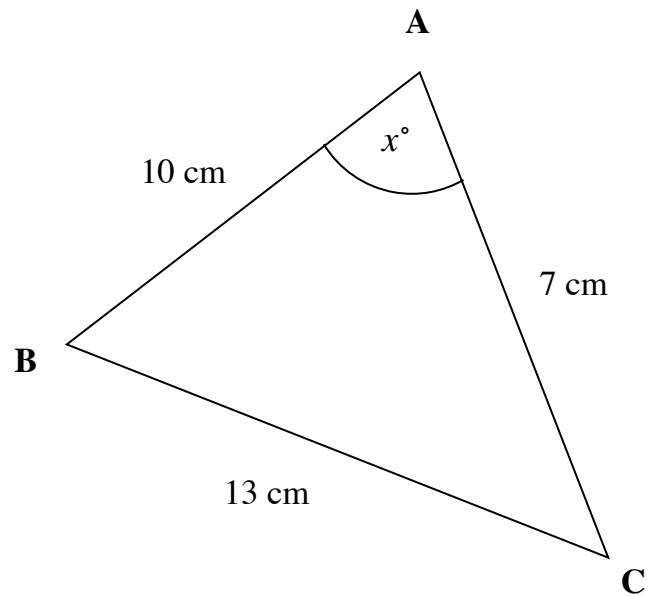
54.6 cm²

.....
(Total for Question 2 is 2 marks)

3. (a) Work out the size of angle BAC.

$$\cos x = \frac{10^2 + 7^2 - 13^2}{2(10)(7)}$$

$$x = \cos^{-1}(\text{ans})$$
$$= 98.2^\circ$$



$$\underline{\hspace{10em}} 98.2^\circ$$

(3)

(b) Hence, work out the area of triangle ABC.

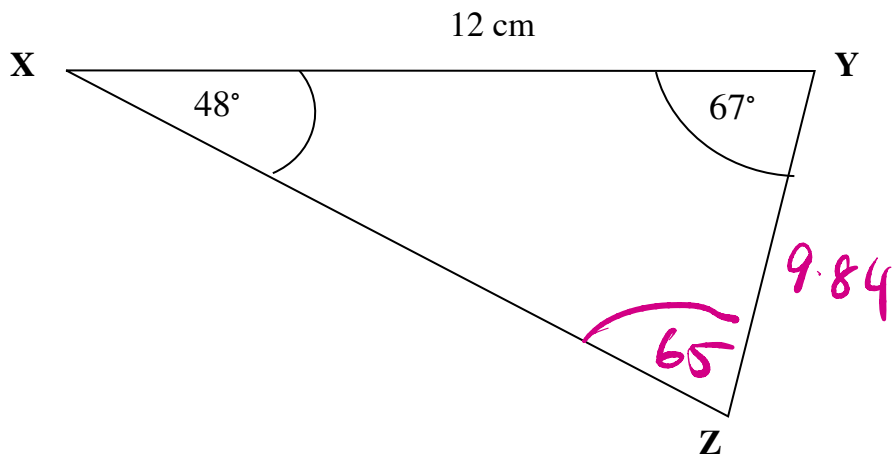
$$\frac{1}{2} (10)(7) \sin(98.2) = 34.6$$

$$\underline{\hspace{10em}} 34.6 \text{ cm}^2$$

(2)

(Total for Question 3 is 5 marks)

4. (a) Work out the size of the side YZ.



$$\frac{YZ}{\sin 48} = \frac{12}{\sin 65}$$

$$YZ = 9.84$$

9.84 cm
.....
(3)

(b) Hence, work out the area of triangle XYZ.

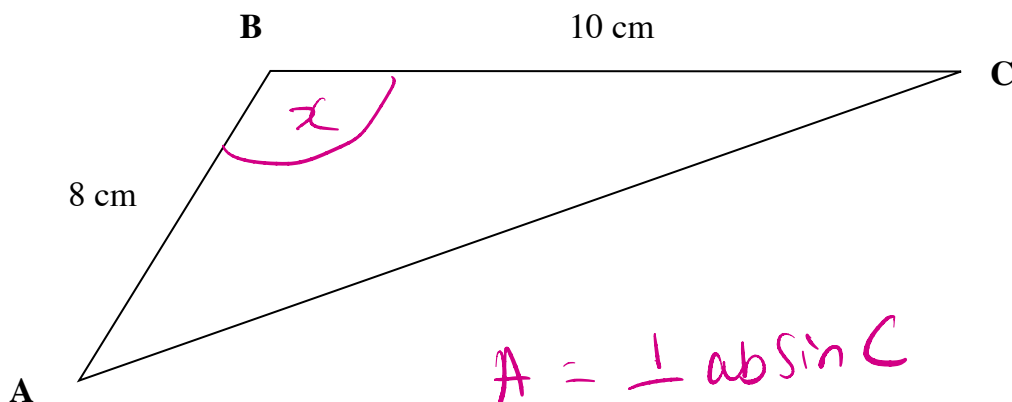
$$\frac{1}{2} \times 12 \times 9.84 \times \sin 67 = 54.3$$

54.3 cm²
.....
(2)

(Total for Question 4 is 5 marks)

5. The area of triangle ABC is 30cm^2 .

(a) Work out the size of angle ABC.



$$A = \frac{1}{2} ab \sin C$$

$$30 = \frac{1}{2} (8)(10) \sin x$$

$$\sin x = \frac{30}{\frac{1}{2}(8)(10)}$$

$$x = \sin^{-1}(\text{ans}) = 48.6$$

$$\underline{\underline{48.6^\circ}}$$

(4)

(b) Hence, work out the length of the side AC.

$$AC^2 = 10^2 + 8^2 - 2(10)(8) \cos(48.6)$$

$$AC = \sqrt{\text{ans}}$$

$$= 7.63$$

$$\underline{\underline{7.63 \text{ cm}}}$$

(3)

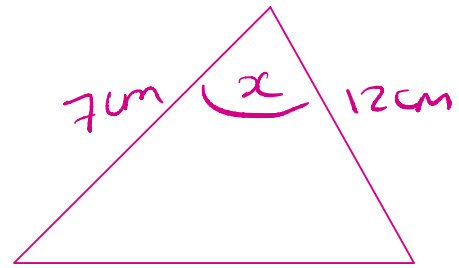
(Total for Question 5 is 7 marks)

6. The area of triangle ABC is 42cm^2 .

One side is 7cm and another is 12cm .

Is triangle ABC right angled?

You must give reason for your answer.



$$42 = \frac{1}{2} (7)(12) \sin x$$

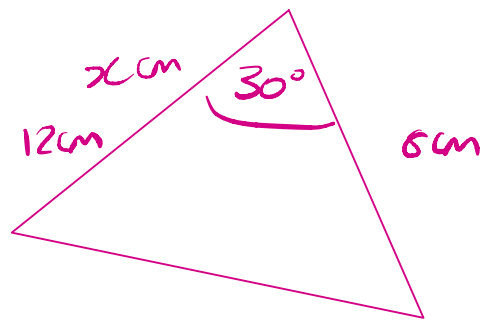
$$42 = 42 \sin x$$

$$1 = \sin x \Rightarrow x = 90^\circ$$

Yes

(Total for Question 6 is 4 marks)

7. The area of a triangle is 24 cm^2 .
Two sides are $x \text{ cm}$ and 8 cm .
The angle between them is 30° .
Find the length of the third side.



$$A = \frac{1}{2} ab \sin C$$

$$24 = \frac{1}{2} x (8) \sin 30$$

$$24 = 4x \left(\frac{1}{2} \right)$$

$$x = 12$$

$$a^2 = 12^2 + 8^2 - 2(12)(8)\cos(30)$$

$$a = \sqrt{} = 6.45$$

6.45 cm

.....
(Total for Question 7 is 5 marks)