IBDP Mathematics
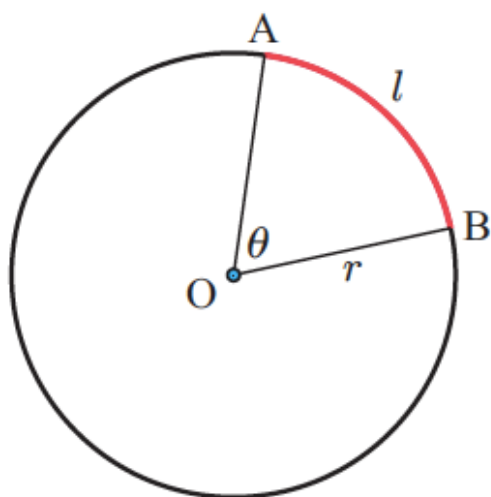Applications and interpretation (SL)
Sector and triangle

Sector and Triangle

Arc Length

$l = 2\pi r \times \dfrac{\theta}{360}$, where θ is the angle of sector in **degrees**

1. Find the arc length for the sector of a circle of radius 5 cm and angle 45°.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle

2. Find the arc length for the sector of a circle of radius 10 cm and angle 120° radians.

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle
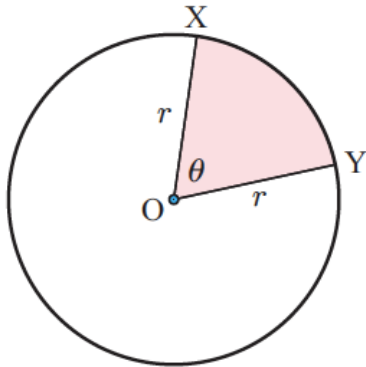
Sector area

Area = πr^2 x $\dfrac{\theta}{360}$, where θ is the angle of sector in **degrees**

1. Find the sector area for the sector of a circle of radius 6 cm and angle 70°.

_____

_____

_____

_____

_____

_____

_____

2. Find the sector area for the sector of a circle of radius 10 cm and angle 120°.

_____

_____

_____

_____

_____

_____

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle

Right angled triangle
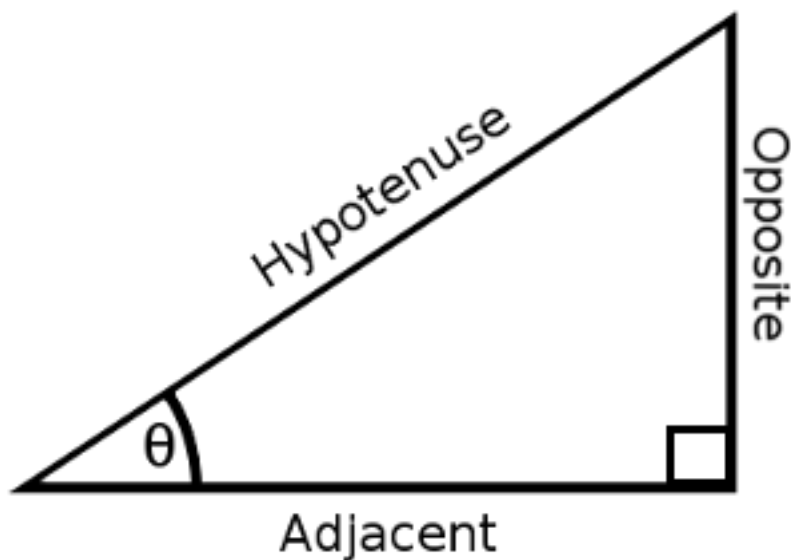
SOH CAH TOA

$$\text{Sin } \theta = \frac{\text{Opposite}}{\text{Hypotenuse}} \qquad \text{Cos } \theta = \frac{\text{Adjacent}}{\text{Hypotenuse}} \qquad \text{Tan } \theta = \frac{\text{Opposite}}{\text{Adjacent}}$$
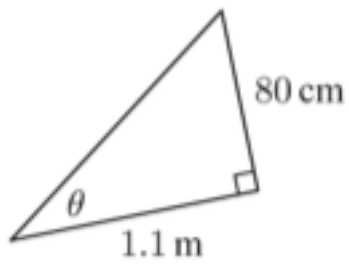
1. Find the measure of the angle marked θ.
(a)

_____

_____

_____

_____

_____

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle

(b)

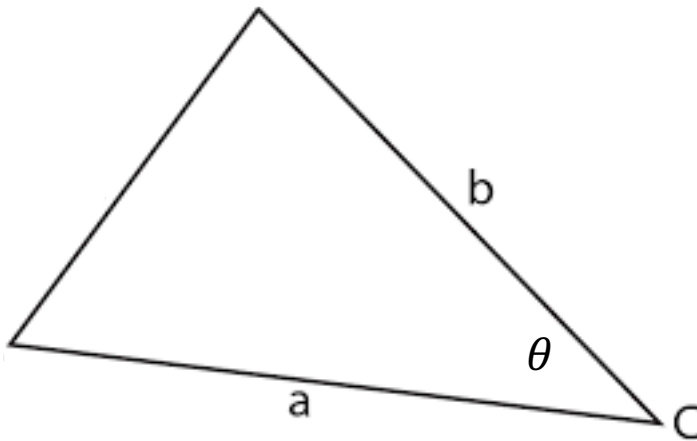IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle
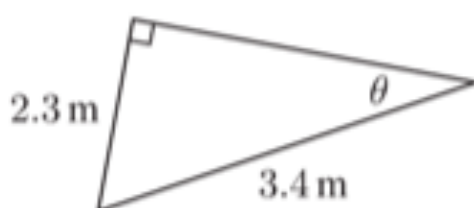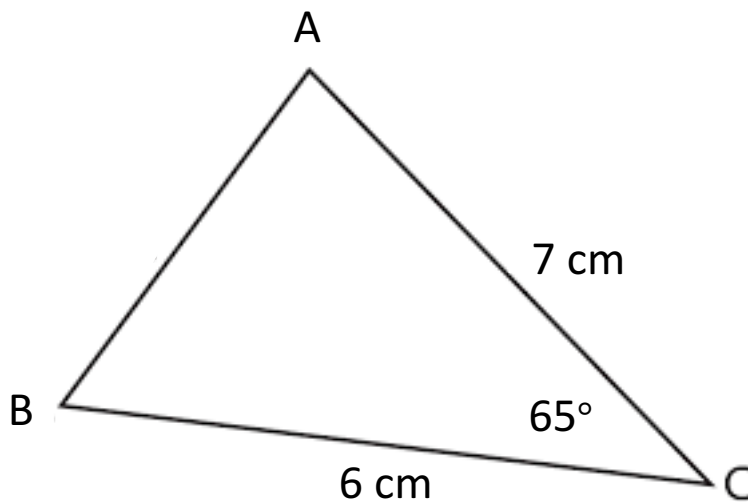
Non-right angled triangle area

Area = $\frac{1}{2}$ ab sin θ

θ is included angle, between side a and b.

1. Find the area of triangle ABC.

IBDP Mathematics
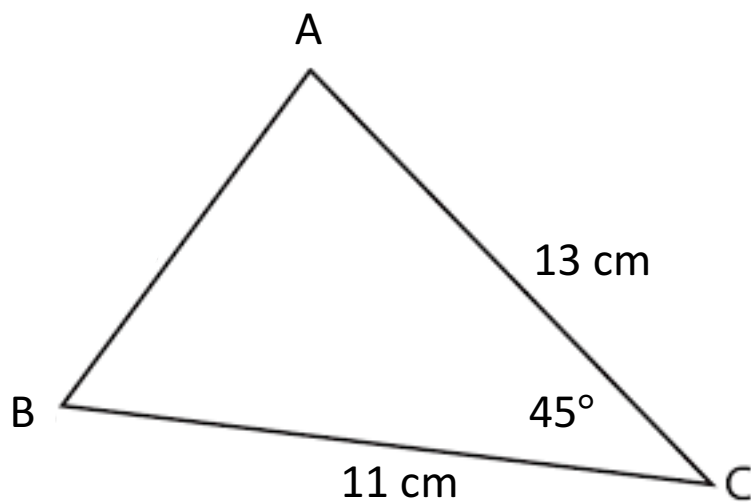Applications and interpretation (SL)
Sector and triangle

2. Find the area of triangle ABC.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

IBDP Mathematics
Applications and interpretation (SL)
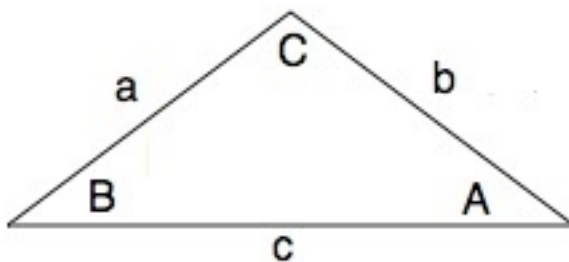Sector and triangle

Sine rule

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Sine rule can be used when the triangles are given:
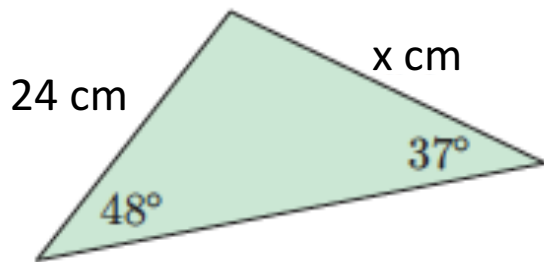
1. two angles and one side

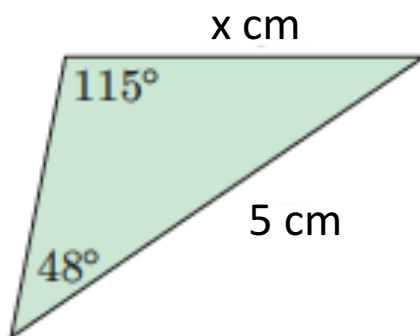OR

2. two sides and a non-included angle

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle

1. Find the value of x.

24 cm

x cm

37°

48°

_____

_____

_____

_____

_____

_____

_____

2. Find the value of x.

x cm

115°

5 cm

48°

_____

_____

_____

_____

_____

_____

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle

Exercise

1. The following diagram shows triangle POR.
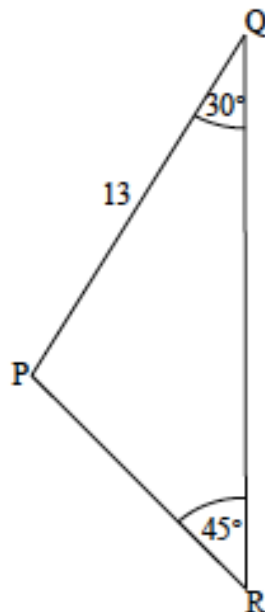
$P\hat{Q}R = 30°$, $Q\hat{R}P = 45°$ and $PQ = 13\,cm$.

Find PR.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle
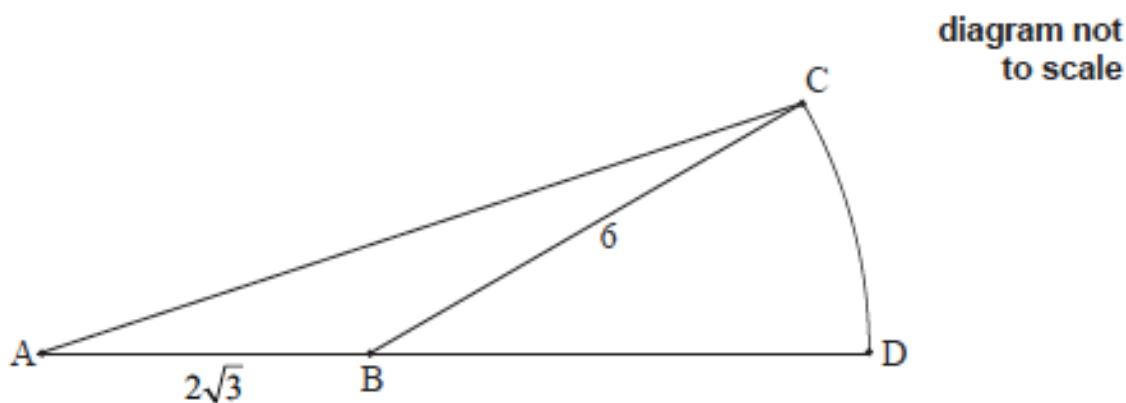
2. The following diagram shows a triangle ABC and a sector BDC of a circle with centre B and radius 6 cm. The points A, B and D are on the same line.

diagram not to scale

$AB = 2\sqrt{3}$ cm, $BC = 6$ cm, area of triangle $ABC = 3\sqrt{3}$ cm^2, $\hat{ABC}$ is obtuse.

(a) Find angle ABC.

(b) Find the exact area of the sector BDC.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

IBDP Mathematics
Applications and interpretation (SL)
Sector and triangle
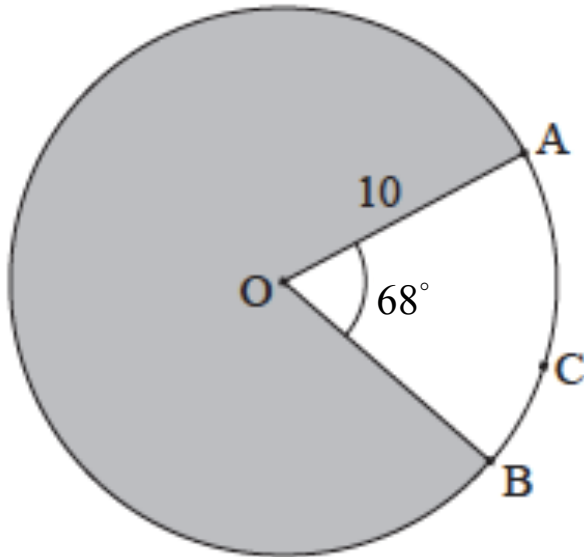
3. The following diagram shows a circle with centre O and a radius of 10 cm. Point A, B and C lie on the circle.

Angle AOB is 68°.

(a) Find the length of arc ACB.
(b) Find the perimeter of the shaded region.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____