## IB SL MATHEMATICS

## TRIG PACKET \#1

NAME: $\qquad$
$\qquad$

1. The diagram shows a vertical pole $P Q$, which is supported by two wires fixed to the horizontal ground at $A$ and $B$.


$$
\begin{aligned}
& \mathrm{BQ}=40 \mathrm{~m} \\
& \mathrm{PBQ}=36^{\circ} \\
& \mathrm{BAQ}=70^{\circ} \\
& \mathrm{ABQ}=30^{\circ}
\end{aligned}
$$

Find
(a) the height of the pole, PQ ;
(b) the distance between A and B.

Working:

Answers:
(a) $\qquad$
(b) $\qquad$
2. Town $A$ is 48 km from town $B$ and 32 km from town C as shown in the diagram.


Given that town $B$ is 56 km from town $C$, find the size of angle $C \hat{A} B$ to the nearest degree.
$\square$
Answer:
3. The following diagram shows a triangle with sides $5 \mathrm{~cm}, 7 \mathrm{~cm}, 8 \mathrm{~cm}$.


Find
(a) the size of the smallest angle, in degrees;
(b) the area of the triangle.

## Working:

Answers:
(a)
(b)
4. The diagrams below show two triangles both satisfying the conditions

$$
\mathrm{AB}=20 \mathrm{~cm}, \mathrm{AC}=17 \mathrm{~cm}, \quad \mathrm{~A} \hat{\mathrm{~B}} \mathrm{C}=50^{\circ}
$$

Diagrams not to scale

$$
\text { Triangle } 1
$$



Triangle 2

(a) Calculate the size of $\mathrm{A} \hat{\mathrm{C}} \mathrm{B}$ in Triangle 2.
(b) Calculate the area of Triangle 1.

Working:

Answers:
(a)
(b)
5. Two boats $A$ and $B$ start moving from the same point $P$. Boat $A$ moves in a straight line at $20 \mathrm{~km} \mathrm{~h}^{-1}$ and boat B moves in a straight line at $32 \mathrm{~km} \mathrm{~h}^{-1}$. The angle between their paths is $70^{\circ}$.

Find the distance between the boats after 2.5 hours.
Working:

Answer:
6. The diagram shows a triangle ABC in which $\mathrm{AC}=7 \frac{\sqrt{2}}{2}, \mathrm{BC}=6, \mathrm{ABC}=45^{\circ}$.

(a) Use the fact that $\sin 45^{\circ}=\frac{\sqrt{2}}{2}$ to show that $\sin \mathrm{BAC}=\frac{6}{7}$.

The point $D$ is on $(A B)$, between $A$ and $B$, such that $\sin B \hat{D} C=\frac{6}{7}$.
(b) (i) Write down the value of B $\hat{D} C+B \hat{A} C$.
(ii) Calculate the angle BCD.
(iii) Find the length of [BD].
(c) Show that $\frac{\text { Area of } \triangle \mathrm{BDC}}{\text { Area of } \triangle \mathrm{BAC}}=\frac{\mathrm{BD}}{\mathrm{BA}}$.

