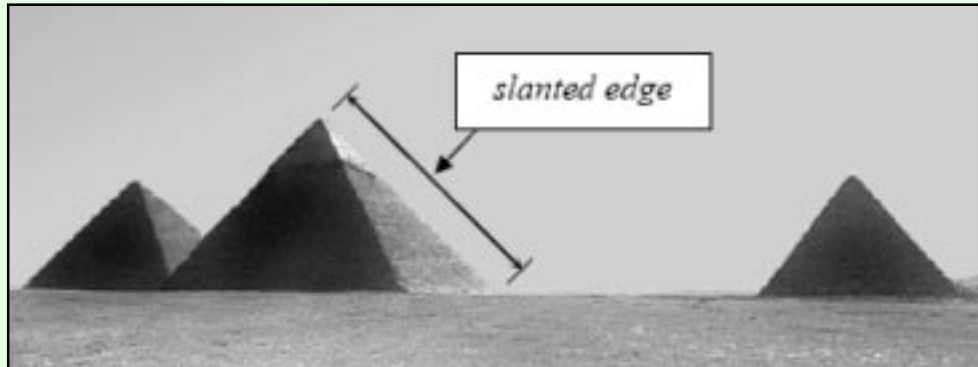


TRIGONOMETRY (Q 4 & 5, PAPER 2)

LESSON NO. 8: SOLVING TRIANGLES

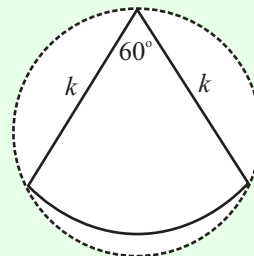
2006

- 5 (b) The great pyramid at Giza in Egypt has a square base and four triangular faces. The base of the pyramid is of side 230 metres and the pyramid is 146 metres high. The top of the pyramid is directly above the centre of the base.



- (i) Calculate the length of one of the slanted edges, correct to the nearest metre.
- (ii) Calculate, correct to two significant figures, the total area of the four triangular faces of the pyramid (assuming they are smooth flat surfaces).
- 4 (c) The diagram shows a sector (solid line) circumscribed by a circle (dashed line).

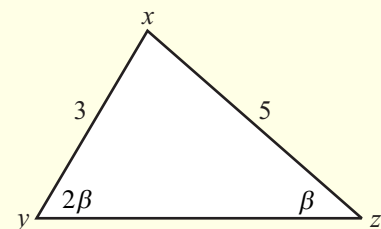
- (i) Find the radius of the circle in terms of k .
- (ii) Show that the circle encloses an area which is double that of the sector.



2005

- 5 (b) In the triangle xyz , $|\angle xyz| = 2\beta$ and $|\angle xzy| = \beta$. $|xy| = 3$ and $|xz| = 5$.

- (i) Use this information to express $\sin 2\beta$ in the form $\frac{a}{b} \sin \beta$, where $a, b \in \mathbf{N}$.

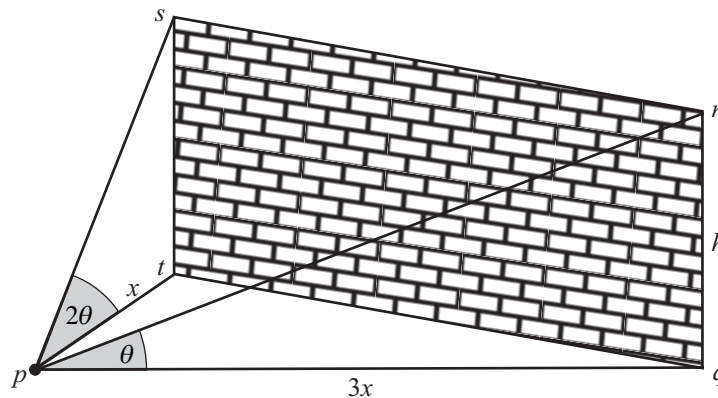


- (ii) Hence express $\tan \beta$ in the form $\frac{\sqrt{c}}{d}$, where $c, d \in \mathbf{N}$.

Cont...

2005

5 (c) $qrst$ is a vertical rectangular wall of height h on level ground. p is a point on the ground in front of the wall. The angle of elevation of r from p is θ and the angle of elevation of s from p is 2θ . $|pq| = 3|pt|$. Find θ .

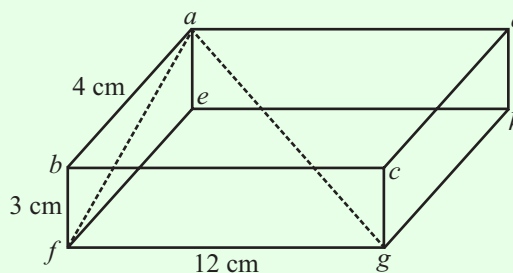


2004

5 (c) The diagram shows a rectangular box. Rectangle $abcd$ is the top of the box and rectangle $efgh$ is the base of the box.

$|ab| = 4$ cm, $|bf| = 3$ cm and $|fg| = 12$ cm.

- (i) Find $|af|$.
- (ii) Find $|ag|$.
- (iii) Find the measure of the acute angle between $[ag]$ and $[df]$. Give your answer correct to the nearest degree.

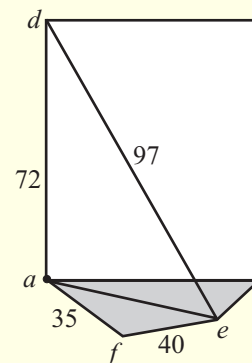


2003

5 (b) a, f and e are points on horizontal ground. d is a point on a vertical wall directly above a .

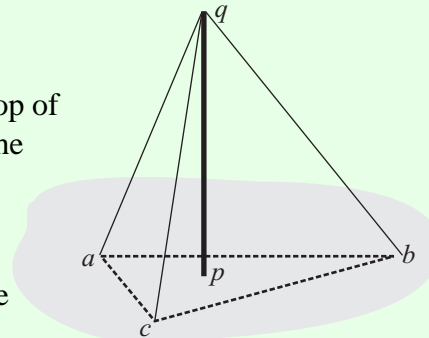
$|ad| = 72$ m, $|de| = 97$ m, $|af| = 35$ m and $|fe| = 40$ m.

- (i) Calculate $|ae|$.
- (ii) Hence, calculate $|\angle afe|$.



2002

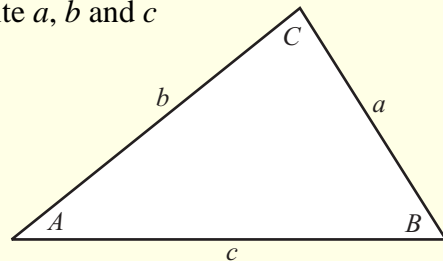
5 (c) A vertical radio mast $[pq]$ stands on flat horizontal ground. It is supported by three cables that join the top of the mast, q , to the points a , b and c on the ground. The foot of the mast, p , lies inside the triangle abc . Each cable is 52 m long and the mast is 48 m high.



- (i) Find the (common) distance from p to each of the points a , b and c .
- (ii) Given that $|ac| = 38$ m and $|ab| = 34$ m, find $|bc|$ correct to one decimal place.

2001

4 (c) A triangle has sides a , b and c . The angles opposite a , b and c are A , B and C , respectively.



- (i) Prove that $a^2 = b^2 + c^2 - 2bc \cos A$.
- (ii) Show that $c(b \cos A - a \cos B) = b^2 - a^2$.

5 (b) xyz is a triangle where $|xy| = 8$ cm and $|yz| = 6$ cm. Given that the area of triangle xyz is 12 cm^2 , find

- (i) the two possible values of $|\angle xyz|$
- (ii) the two possible values of $|xz|$, correct to one decimal place.

ANSWERS

- 2006** 5 (b) (i) 219 m (ii) $86,000 \text{ m}^2$
- 4 (c) (i) $r = \frac{k}{\sqrt{3}}$
- 2005** 5 (b) (i) $\frac{5}{3} \sin \beta$ (ii) $\frac{\sqrt{11}}{5}$
- 5 (c) $\frac{\pi}{6}$
- 2004** 5 (c) (i) 5 cm (ii) 13 cm (iii) 45°
- 2003** 5 (b) (i) 65 m (ii) 120°
- 2002** 5 (c) (i) 20 m (ii) 30.6 m
- 2001** 5 (b) (i) $30^\circ, 150^\circ$ (ii) 4.1 cm, 13.5 cm