

## Maths Tutorials – Trigonometry 1 - Questions

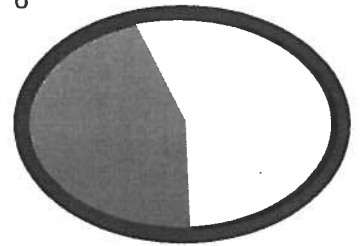
### Q1

- Express  $\frac{2\pi}{5}$  radians in degrees.
- Express  $210^\circ$  in radians.

### Q2

The diagram shows a circle  $c$  with centre  $O$  and radius  $12\text{cm}$ . Also shown is the minor sector  $ABO$ . The minor arc  $[AB]$  subtends an angle of  $\frac{5\pi}{6}$  rads at the centre.

- Label the diagram.
- Find the length of the minor arc  $[AB]$
- Find the area of the major sector  $ABO$



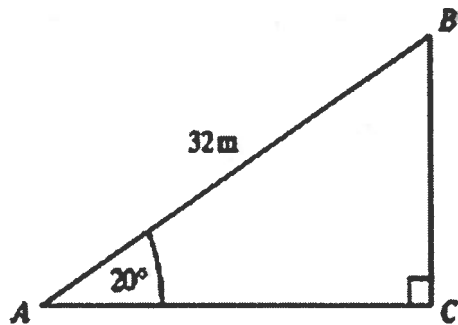
### Q3

The diagram shows a triangle  $ABC$ .

Angle  $A = 20^\circ$  and angle  $C = 90^\circ$   $AB = 32\text{m}$

Calculate the height  $|BC|$ .

Solve the triangle.



### Q4

If  $\tan B = \frac{\sqrt{5}}{2}$ , find the value of  $\sin B$  and  $\cos B$ .

**Q5**

- 1) Find  $\cos 72^\circ 18'$ , correct to 4 decimal places.
- 2) If  $\sin A = 0.5216$ , find  $A$  correct to the nearest second.
- 3) If  $\sin A = \frac{4}{7}$ , find  $A$
- 4) Given  $D = \frac{3}{4}\pi$  Rads find  $\operatorname{cosec} D$

**Q6**

Make sketches of the following triangles:

- An Isosceles right-angled triangle with sides = 1 unit.
- An Equilateral triangle with sides = 2 units. Draw a line to divide this triangle into two equal right-angled triangles.

Solve all three triangles and hence calculate Sin, Cos and Tan of  $30^\circ$ ,  $45^\circ$  and  $60^\circ$  in surd form.

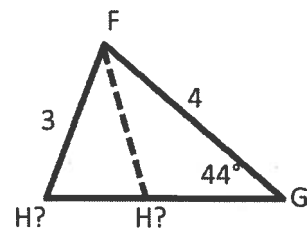
**Q7**

- 1) Express in surd form,  $\cos(-135^\circ)$ .
- 2) If  $\sin x = -\frac{\sqrt{3}}{2}$ , find two values for  $x$  if  $0^\circ \leq x \leq 360^\circ$ .

**Q8**

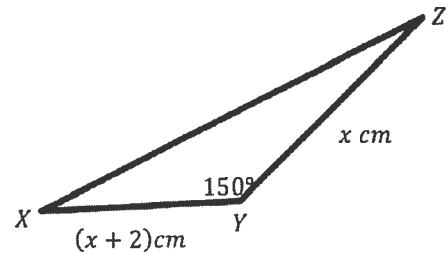
In a triangle  $FGH$ ,  $|FG| = 4\text{cm}$ ,  $|FH| = 3\text{cm}$  and  $|\angle FGH| = 44^\circ$ .

Find the possible values of  $\angle FHG$ .



**Q9**

Given that the area of this triangle is  $6 \text{ cm}^2$  find the value of  $x$

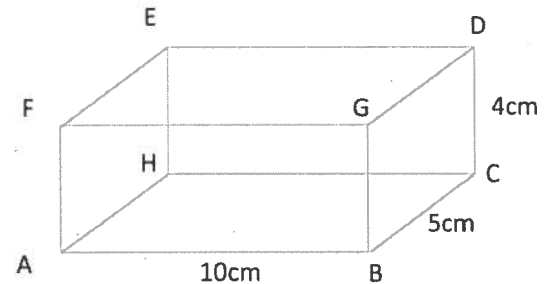
**Q10**

A builder ropes off a triangular plot of ground,  $PQR$ . The length of  $|PQ| = 42 \text{ m}$  and the length of  $|PR| = 50 \text{ m}$ .  $|\angle QPR| = 72^\circ$ . Calculate the length of rope needed by the builder. Give your answer correct to one decimal place.

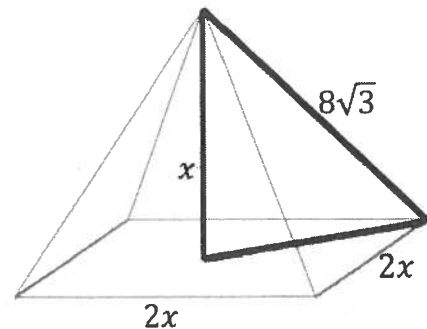
**Q11**

An open rectangular box has dimensions  $10 \text{ cm}$  by  $5 \text{ cm}$  by  $4 \text{ cm}$ , as shown.

- 1) Find the length of the diagonal  $[GH]$ .
- 2) Find the measure of the angle between  $GH$  and the base of the box.

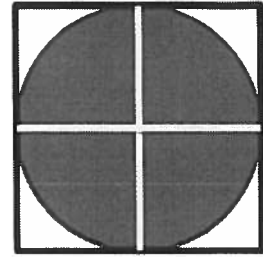
**Q12**

The diagram represents a right pyramid. The base is a square of side  $2x \text{ cm}$ . The length of each of the slant edges is  $8\sqrt{3} \text{ cm}$ . The height of the pyramid is  $x \text{ cm}$ . Calculate the value of  $x$ .

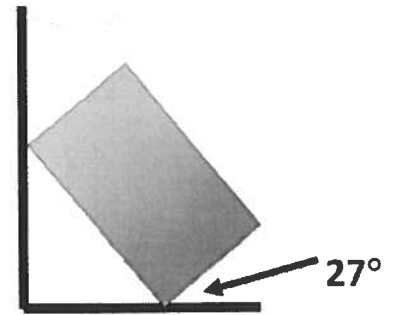


**Q13**

A square is inscribed in a circle, as shown. If the area of the circle is  $\pi$  square units, find the area of the square.

**Q14**

A rectangular paving stone 3m by 1m rests against a vertical wall as shown. What is the height of the highest point of the stone above the ground? Give your answer in meters, correct to two decimal places.

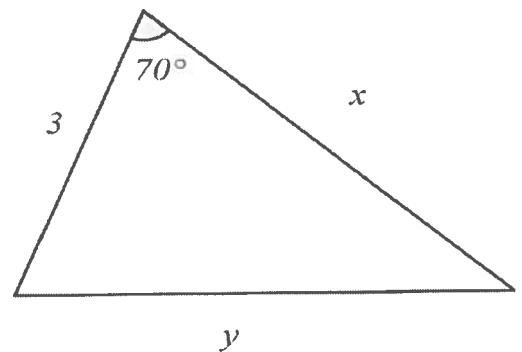
**Q15**

Find all the solutions to the equation  $\cos 3x = \frac{\sqrt{3}}{2}$ , for  $0^\circ \leq x \leq 360^\circ$ .

**Q16**

The area of the triangle shown is 15 square units.

- Find the value of  $x$ , correct to two decimal places.
- Using the Cosine Rule, find the value of  $y$ .

**Q17**

The diagram shows a semi-circle standing on a diameter  $[AC]$ , and  $[BD] \perp [AC]$ .

If  $|AB| = x$  and  $|BC| = 1$  and  $|BD| = y$ , write  $y$  in terms of  $x$ .

