

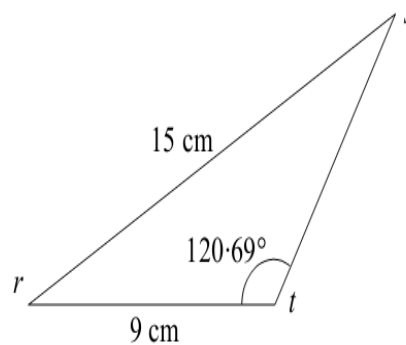
2003 Sample Paper

Question 5

Q5. (a) Without using a calculator or the Tables, construct an angle A such that $\sin A = \frac{4}{5}$.

(b) In the triangle rst , $|rs| = 15$ cm
 $|rt| = 9$ cm and $|\angle rts| = 120.69^\circ$.

Calculate $|\angle srt|$, giving your answer correct to two decimal places.



(c) (i) ϑ is an acute angle such that $\cos \vartheta = \frac{2}{3}$.

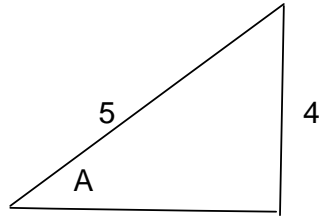
Find the value of $\sin \vartheta$ in surd form.

(ii) In a triangle xyz , $|xy| = 7$, $|yz| = 6$ and $\cos \angle xyz = \frac{2}{3}$.

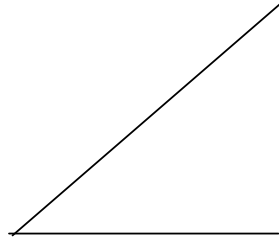
Find the area of the triangle, giving your answer in the form $a\sqrt{b}$, where $a, b \in \mathbb{N}$.

Solution

Q5. (a) Without using a calculator or the Tables, construct an angle A such that $\sin A = \frac{4}{5}$.

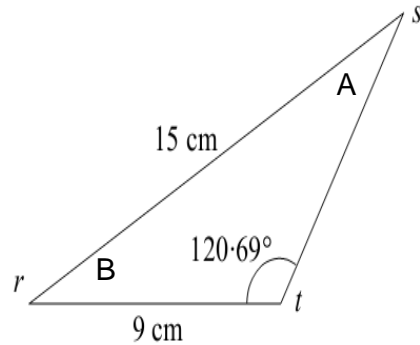


We are given $\sin A = \frac{4}{5}$ but we already know that $\sin A = \frac{\text{opp}}{\text{hyp}}$



(b) In the triangle rst , $|rs| = 15$ cm
 $|rt| = 9$ cm and $|\angle rts| = 120.69^\circ$.

Calculate $|\angle srt|$, giving your answer correct to two decimal places.



$$\frac{\sin A}{9} = \frac{\sin 120.69}{15}$$

$$\frac{\sin A}{9} = \frac{0.85994}{15}$$

$$\frac{\sin A}{9} = 0.05732$$

$$\sin A = 0.5159$$

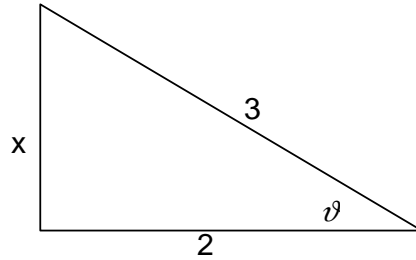
$$A = 31.06^\circ$$

$$B = 180^\circ - (120.69^\circ + 31.06^\circ)$$

$$= 180^\circ - 151.75^\circ$$

$$= 28.25^\circ$$

- (c) (i) ϑ is an acute angle such that $\cos \vartheta = \frac{2}{3}$.
Find the value of $\sin \vartheta$ in surd form.



$$H^2 = O^2 + A^2$$

$$3^2 = x^2 + 2^2$$

$$x^2 + 4 = 9$$

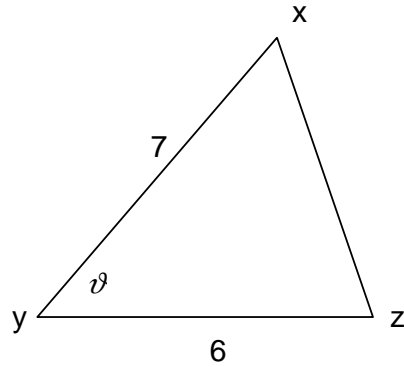
$$x^2 = 5$$

$$x = \sqrt{5}$$

$$\sin \vartheta = \frac{\sqrt{5}}{3}$$

- (ii) In a triangle xyz , $|xy| = 7$, $|yz| = 6$ and $\cos \angle xyz = \frac{2}{3}$.

Find the area of the triangle, giving your answer in the form $a\sqrt{b}$, where $a, b \in N$.



$$\text{Area} = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2}(6)(7)\frac{\sqrt{5}}{3}$$

$$= 7\sqrt{5}$$