Questions

Unit (4)

Trigonometry and Geometry

(1) Complete:

a) 85° 38` 8`` = …….. (in degrees)

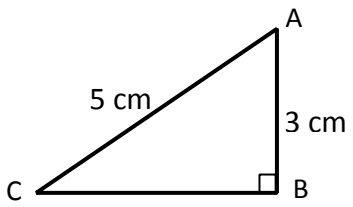
b) 56.18° = …….. (in degrees, minutes and seconds)

(2) In the opposite figure:

Δ ABC is a right angled triangle at B,

AB = 3 cm, AC = 5 cm , then

sin C × cos C = ……..



(3) If the ratio between the measures of two complementary angles is 3 : 4, find the degree measure of the greater angle in measure.

(4) If the ratio between the measures of the interior angles of the triangle is 3 : 4 : 7, find the degree measure of each angle.

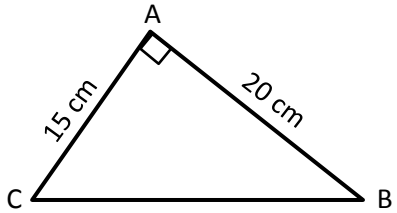
(5) In the opposite figure:

ABC is a triangle in which

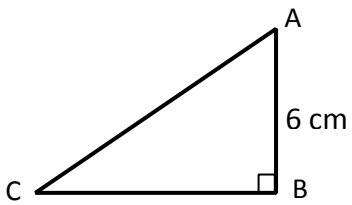
m (∠ A) = 90°, AC = 15 cm

and AB = 20 cm

Prove that: cos C cos B – sin C sin B = zero



(6) In the opposite figure:



ABC is a right-angled Δ at B,

AB = 6 cm, tan C = $\frac{3}{4}$, find:

1) The length of each of $\overline{BC}$ and $\overline{AC}$

2) sin A + cos A

(7) Without using calculator prove each of the following:

a) $\cos 60° = 2 \cos^2 30 - 1$

b) $2 \cos^2 30° - 1 = 1 - 2 \sin^2 30$

c) $\cos 60° = \cos^2 30 - \sin^2 30$

d) $\cos^2 60 = 5 \sin^2 30 - \tan^2 45°$

(8) Find the value of x of each of the following:

a) $x \sin^2 45° = \tan^2 60°$

b) $x \sin 30° \cos^2 45° = \sin^2 60°$

c) $\sin x \sin^2 60° = 3 \sin^2 45° \cos^2 45° \cos 60°$

Unit (5) Analytical geometry

Lesson (1) Distance between two points

(1) If A (3 , 1) , B (1 , 2) and C (5 , 4), prove that BC = 2 AB

(2) Prove that the points A (4 , 3) , B (1 , 1) and C (-5 , -3) are collinear

(3) Show the type of each of the following triangles according to its angles if its vertices are:

a) A (2 , 1) , B (4 , -2) , C (7 , 5)

b) A (4 , 4) , B (3 , -1) , C (-2 , 4)

c) A (1 , -1) , B (2 , 1) and C (-3 , -2)

(4) Prove that the triangle with vertices of points: A (5 , -5), B (-1 , 7) and C (15, 15) is a right-angled Δ at B and find its area.

(5) ABCD is a quadrilateral where A (2, 4) , B (-3 , 0) , C (-7 , 5) and D (-2, 4) prove that ABCD is a square.

(6) Prove that: The points A (0 , 1) , B (4 , 5) , C (1 , 8) and D (-3 , 4) are vertices of a rectangle and find its diagonal length.

(7) If A (x , 3) , B (3, 2) and C (5 , 1) and AB = BC, then find the value of x.

(8) Find the value of a if the distance between the two points (a , 7), (-2 , 3) equals 5 length unit.

Model Answers

Trigonometry

(1) a) 85.635 b) 56° 10` 48``

(2) BC = 4 cm , sin C × cos C = $\frac{3}{5} \times \frac{4}{5} = \frac{12}{25}$

(3) 1st : 2nd : sum

3 : 4 : 7

? : ? : 90

1st angle = 38° 34` 17``

2nd angle = 51° 25` 42``

(4) 1st : 2nd : 3rd : sum

3 : 4 : 7 : 14

: : : 180

1st angle = 38° 34` 17``

2nd angle = 51° 25` 42``

3rd angle = 90°

(5) BC = 25 cm

cos C cos B – sin C sin B = $\frac{15}{25} \times \frac{20}{25} - \frac{20}{25} \times \frac{15}{25}$ = zero

(6) tan C = $\frac{opp.}{Adj} \rightarrow \frac{3}{4} = \frac{6}{BC} \rightarrow BC = \frac{6 \times 4}{3} = 8$ cm

AC = 10 cm

sin A + cos A = $\frac{8}{10} + \frac{6}{10} = \frac{14}{10} = \frac{7}{5}$

(7) Do it yourself