Sine and Cosine Formulae and their Applications Ex-10.2 Q1

The area of a triangle ABC is given by

$$\Delta = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2} \times 5 \times 6\sin 60^\circ$$

$$= \frac{15\sqrt{3}}{2}\text{sq.unit}$$

Sine and Cosine Formulae and their Applications Ex-10.2 Q2

The area of a triangle ABC is given by

$$\Delta = \frac{1}{2}ab\sin C$$

$$\cos C = \frac{a^2+b^2-c^2}{2ab}$$

$$= \frac{2+3-5}{2\sqrt{6}}$$

$$= 0$$

$$\sin C = \sqrt{1-\cos^2 C}$$

$$= 1$$

Therefore,

$$\Delta = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2}\sqrt{6}$$

Sine and Cosine Formulae and their Applications Ex-10.2 Q3

We have, $a = 4, b = 6$ and $c = 8$

$$\cos A = \frac{b^2+c^2-a^2}{2bc} = \frac{7}{8}$$

$$\cos B = \frac{a^2+c^2-b^2}{2ac} = \frac{11}{16}$$

$$\cos C = \frac{a^2+b^2-c^2}{2ab} = -\frac{1}{4}$$

$$8\cos A + 16\cos B + 4\cos C = 8 \times \frac{7}{8} + 16 \times \frac{11}{16} + 4 \times \left(-\frac{1}{4}\right)$$

$$= 17$$

Sine and Cosine Formulae and their Applications Ex-10.2 Q4

In any $\triangle ABC$, we have

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac}$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

we have,

$a = 18, b = 24, c = 30$

Therefore,

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc} = \frac{1152}{1440} = \frac{4}{5}$$

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac} = \frac{648}{1080} = \frac{3}{5}$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab} = \frac{0}{864} = 0$$

*********** END **********