

Pg. 23: #2, 3acd, 4 ac, 5 bd, 6 ad, 7-9, 11, 13-15

#3. a) $\sin A$ and point P

$\sin A = \frac{y}{r}$

$r = \sqrt{x^2 + y^2}$

$= \sqrt{(-4)^2 + 3^2}$

$= \sqrt{16 + 9}$

$= \sqrt{25}$

$= 5$

$\therefore \sin A = \frac{3}{5}$

$= \frac{\sin A}{1}$

Sep 9-1:12 PM

Example 1: Find side length a.

Ans: We cannot find side length a since we cannot use the primary trigonometric ratios (sine, cosine and tangent) because we are not dealing with a right triangle.

The Sine Law

Some situations are modelled by non-right triangles. The leaning Tower of Pisa, for example leans from its vertical and does not form a right angle with the ground. So, the height of the tower must be determined using other tools of trigonometry, such as the sine law.

The Sine Law is used in acute and obtuse (oblique) triangles.

Consider the following triangles

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ OR $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

May 20-12:22 PM

Example 1: Find the indicated quantities in the following triangles. Round answers to the nearest unit of measurement.

a) Write the sine law for $\triangle ABC$.

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$\frac{a}{\sin A} = \frac{23.6}{\sin 35^\circ} = \frac{c}{\sin 75^\circ}$

- Find $\angle A$, $\angle A = 180^\circ - 75^\circ - 35^\circ = 70^\circ$

- Use $\angle A = 70^\circ$ and $\frac{a}{\sin A} = \frac{23.6}{\sin 35^\circ}$ to find a.

$\frac{a}{\sin 70^\circ} = \frac{23.6}{\sin 35^\circ}$ $\times \sin 70^\circ$ OR $\frac{a}{\sin 70^\circ} = \frac{41.1}{\sin 35^\circ}$

$a = \frac{23.6 \sin 70^\circ}{\sin 35^\circ}$

$\therefore a = 38.7 \text{ cm}$ ← Difference is due to rounding

May 24-12:13 PM

b) Write the sine law for $\triangle KLM$.

$\frac{k}{\sin K} = \frac{l}{\sin L} = \frac{m}{\sin M}$

$\frac{2.2}{\sin 69^\circ} = \frac{l}{\sin 76^\circ} = \frac{m}{\sin 35^\circ}$

① Find $\angle L$

$\angle L = 180^\circ - 69^\circ - 76^\circ = 35^\circ$

- Find k

$\frac{k}{\sin 69^\circ} = \frac{2.2}{\sin 35^\circ}$

$k = \frac{2.2 \times \sin 69^\circ}{\sin 35^\circ}$

$k \approx 3.58$

$\therefore \angle L = 35^\circ$

$k \approx 3.6 \text{ m}$

$m \approx 3.7 \text{ m}$

- Find m

$\frac{2.2}{\sin 35^\circ} = \frac{m}{\sin 76^\circ}$

$\sin 76^\circ \left(\frac{2.2}{\sin 35^\circ} \right) = \sin 76^\circ \left(\frac{m}{\sin 76^\circ} \right)$

$\frac{2.2 \times \sin 76^\circ}{\sin 35^\circ} = m$

$m \approx 3.72$

Homework: Pg. 32: #5 a, 6, 8

Feb 3-9:09 PM