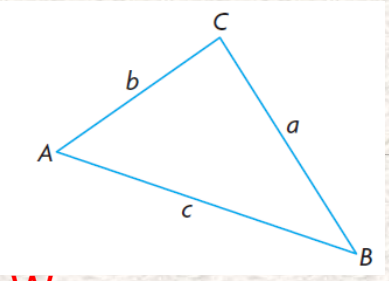
Nov. 30, 2012

The Cosine Law

Mar. 11, 2020



$$a^2 = b^2 + c^2 - 2bc\cos A$$
$$b^2 = a^2 + c^2 - 2ac\cos B$$
$$c^2 = a^2 + b^2 - 2ab\cos C$$

Warm-up:

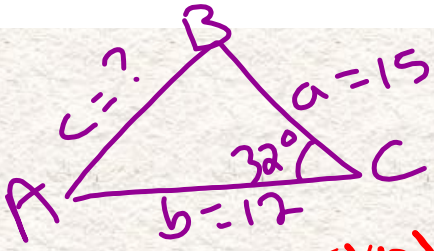
In Triangle ABC,

a = 15

b = 12

$\cos C = \frac{106}{125} \Rightarrow \angle C = 32°$

Find c.



$c^2 = 15^2 + 12^2 - 2(15)(12)\cos 32°$

$c^2 = 225 + 144 - 305.3$

$\boxed{c = 8}$

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

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3. In a volleyball game, a player serves the ball from point A. The angle through which the ball must be served in order to stay in the court can be represented by the angle θ.

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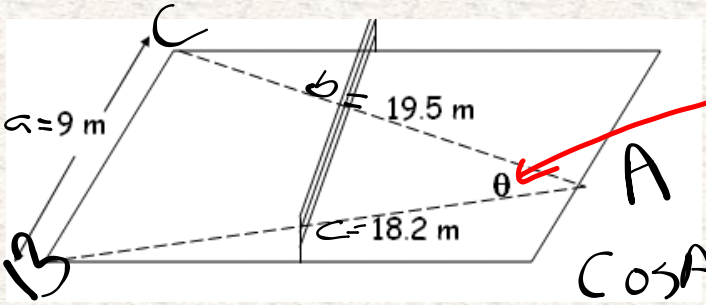
Find the measure of angle θ, to the nearest degree.



27°

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

$= \frac{(19.5)^2+(18.2)^2-9^2}{2(19.5)(18.2)}$

$= 0.888\ldots$

$\angle A = \cos^{-1}(0.888\ldots)$

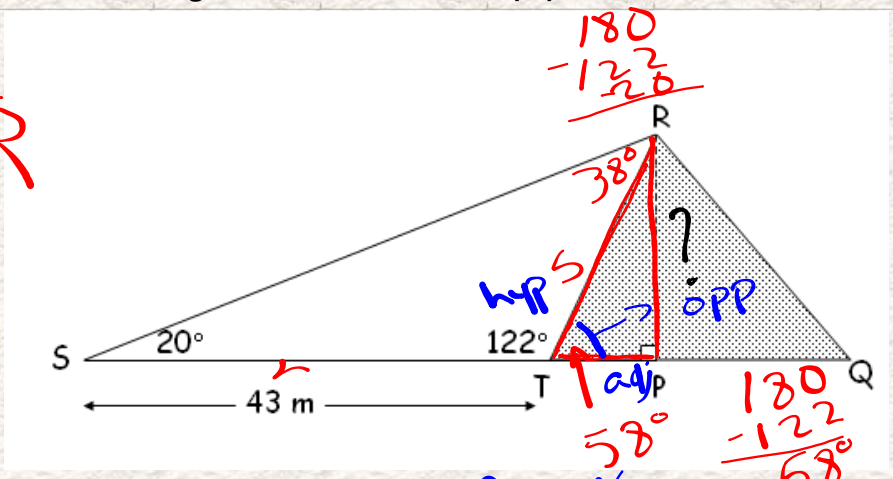
4. At a local pulp and paper mill, wood chips are moved by conveyor belt to a top of the wood chip pile, as shown in the cross section diagram below. Calculate the height of the wood chip pile RP.

$\frac{s}{\sin S} = \frac{r}{\sin R}$

$s = \frac{r \cdot \sin S}{\sin R}$

$s = \frac{43 \sin 20^\circ}{\sin 38^\circ}$

$s = 23.9\text{ m}$



$180 - 122 = 58^\circ$

$\sin\theta = \frac{x}{23.9}$

$\sin 58^\circ \cdot (23.9) = x$

The height of the wood chip pile is RP = 20.3 m

Try Pg 171:
#3 (b) & (c) #4 (b) & #9

Attachments

PM11-3s2.gsp