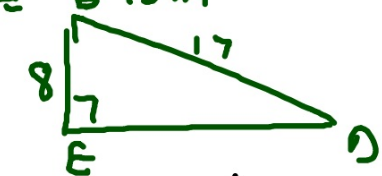
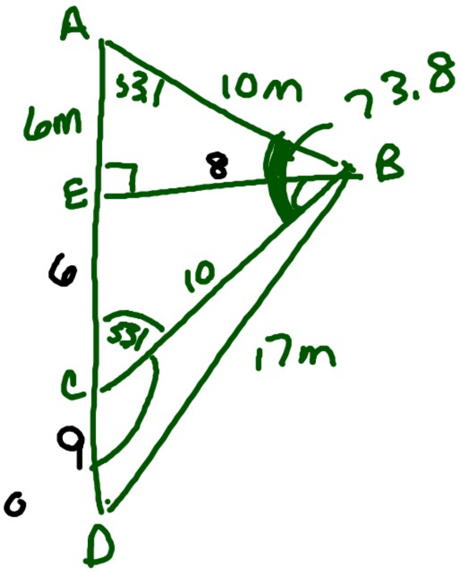
2).

a) $BE = 8m$

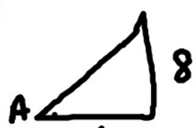
$CE = 6m$

$DE = 15m$





b) $E\hat{A}B$



$\tan^{-1}\left(\frac{8}{6}\right) = A \approx 53.1^\circ$

$B\hat{C}E = E\hat{A}B = 53.1^\circ$

$B\hat{C}D = 180 - 53.1 = 126.9^\circ$

$A\hat{B}D = 98.8^\circ \quad \frac{\sin B}{21} = \frac{\sin(53.1)}{17}$

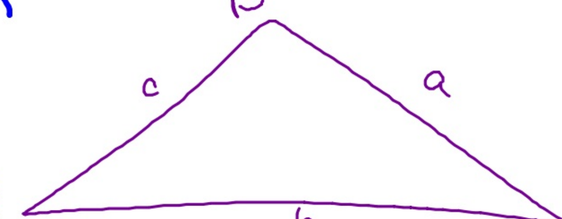
$C\hat{B}D = 98.8 - 73.8 = 25^\circ$

The Law of Cosines

- use when given SSS or SAS


- see page 386 for derivation

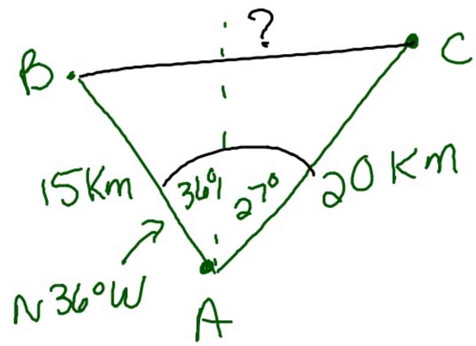
Cosine Rule



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

Angles
$$A = \cos^{-1}\left(\frac{b^2 + c^2 - a^2}{2bc}\right)$$
$$B = \cos^{-1}\left(\frac{a^2 + c^2 - b^2}{2ac}\right)$$

$\boxed{Ex}$ # 4



HW 20 11 I
p. 389
#1 a, c, 2, 3, 6

$$BC^2 = 15^2 + 20^2 - 2(15)(20)\cos 63^\circ$$

$$a^2 \quad b^2 + c^2 - 2bc \cos A$$

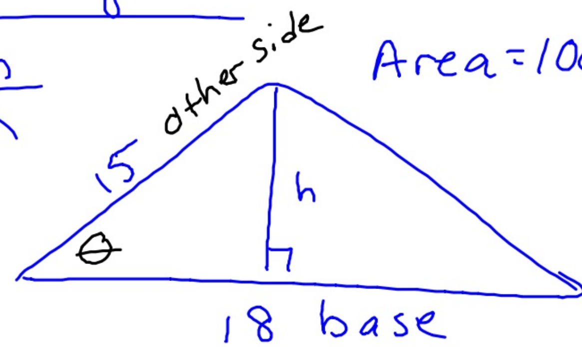
$$\begin{pmatrix}\text{Side I'm} \\ \text{looking} \\ \text{for}\end{pmatrix}^2 = \begin{matrix}\text{Side 1} \\ \text{I Got}\end{matrix}^2 + \begin{matrix}\text{Side 2} \\ \text{I Got}\end{matrix}^2 - 2(\text{Side 1})(\text{Side 2})\cos\begin{pmatrix}\text{Angle} \\ \text{across} \\ \text{from} \\ \text{Side} \\ \text{I} \\ \text{want}\end{pmatrix}$$

$$BC \approx 18.8 \text{ Km}$$

Area of a triangle

$A = \frac{1}{2}bh = \frac{bh}{2}$

$\text{Area} = 100\,m^2$



$A = \frac{1}{2}bc\sin\theta$

HW 11J
p. 390-391
1b, 1d, 3

$$100 = \frac{1}{2}(18)(15)\sin\theta$$

$$\theta = \sin^{-1}\left(\frac{100}{9\cdot 15}\right) \approx 47.8^\circ$$