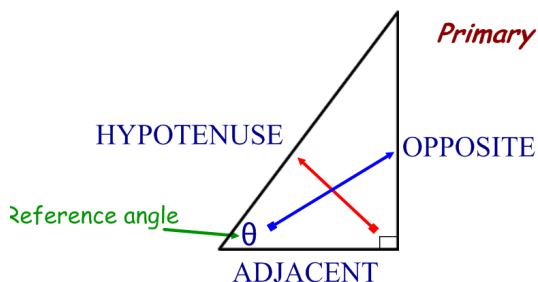


## REVIEW - What formula do I use? Ask yourself...

- Is it a right triangle? If Yes, then...



Primary Trigonometric Ratios

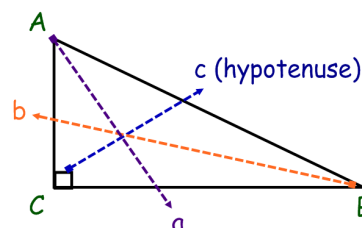
$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

Memory Aid: "SOH CAH TOA"

Pythagorean Theorem



$$c^2 = a^2 + b^2$$

- If you are finding a side, do you have **SAS**? If Yes, then...

Law of Cosines

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

- If you are finding an angle, do you have **SSS**? If Yes, then...

Law of Cosines (rearranged)

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

- Anything else...use your Law of Sines!

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

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

"when looking for a side"

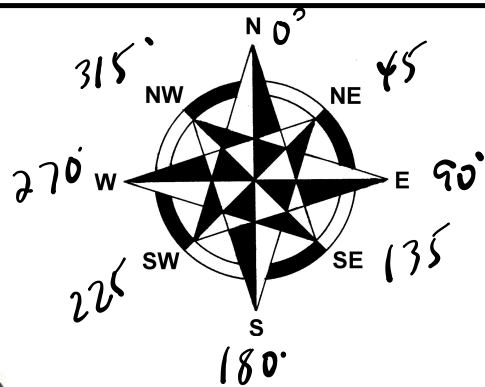
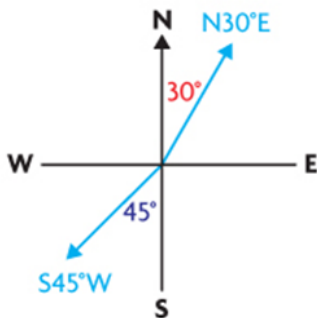
"when looking for an angle"

# MORE APPLICATIONS... Bearings

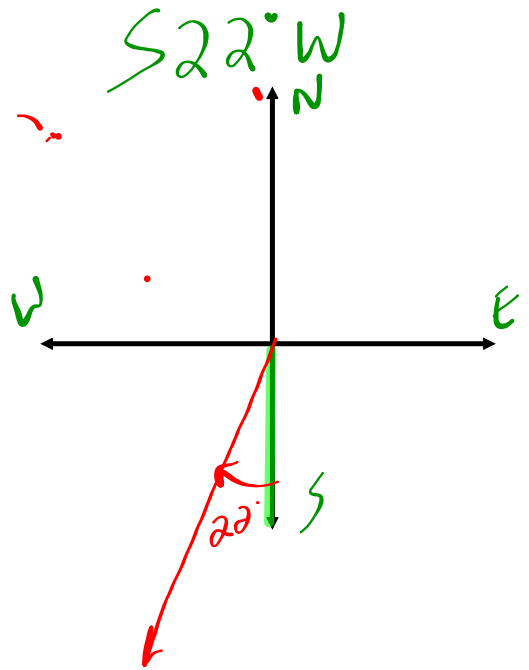
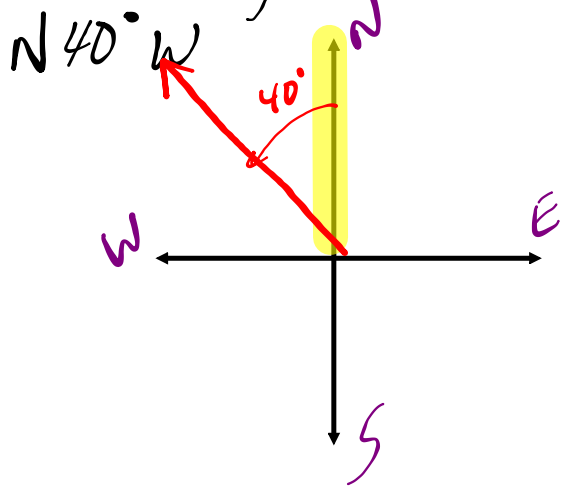
## NOTE:

### Communication Tip

Directions are often stated in terms of north and south on a compass. For example,  $N30^\circ E$  means travelling in a direction  $30^\circ$  east of north.  $S45^\circ W$  means travelling in a direction  $45^\circ$  west of south.



Bearings...



Booklet Questions... 10.12: #8 - 12

Let's do #8 TOGETHER...

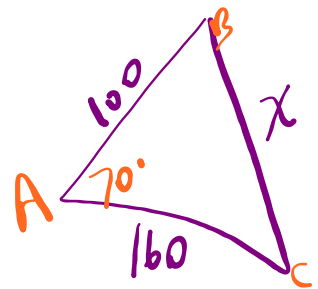
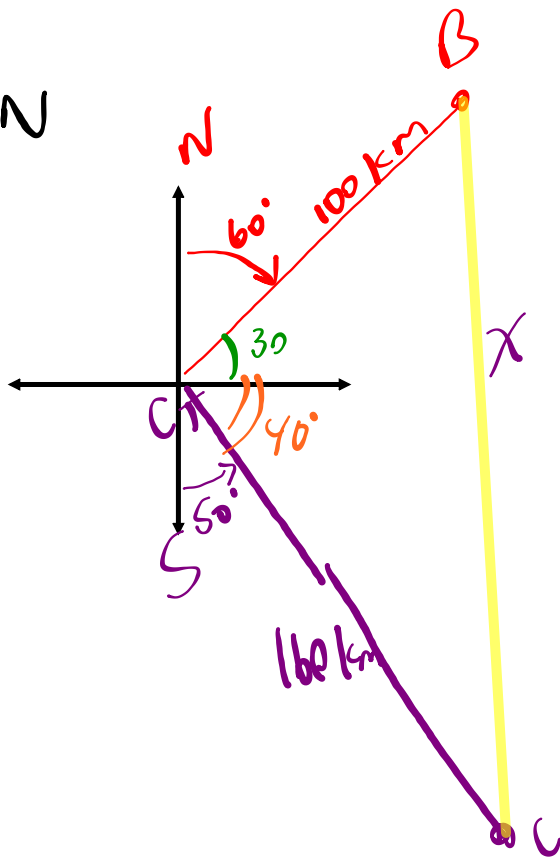
8 In an airport control tower A, 2 planes at B and C are located at the same altitude on a radar screen. The range finder determines one plane to bear  $N60^\circ E$  at 100 km while the other bears  $S50^\circ E$  at 160 km. How far apart are the planes from each other?

$60^\circ E$  of N

$50^\circ E$  of S

Strategy

Draw 2 pictures



Law of Cosines

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

$$x^2 = 160^2 + 100^2 - 2(160)(100)\cos 70^\circ$$

$$\sqrt{x^2} = \sqrt{24655}$$

$$x = 157 \text{ km}$$