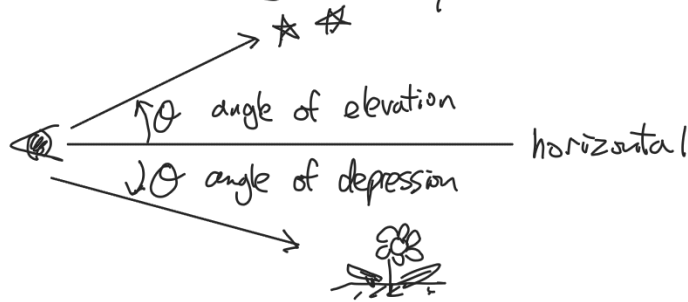
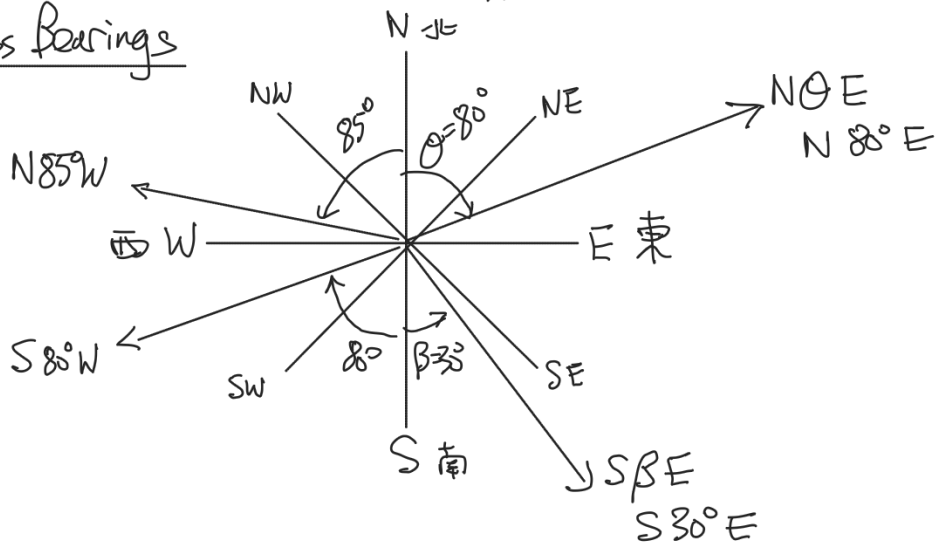


24 Application of Trigonometry

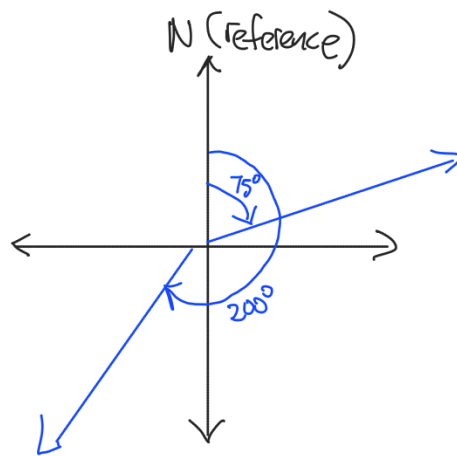
Review



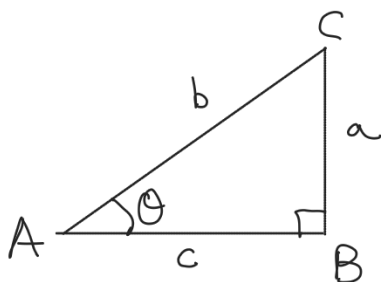
Compass Bearings



True Bearings



Right Angled Triangles

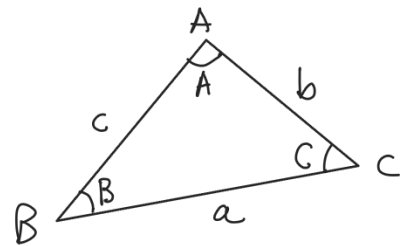


$$\sin \theta = \frac{a}{b}$$

$$\cos \theta = \frac{c}{b}$$

$$\tan \theta = \frac{a}{c}$$

Sin/cos formulae



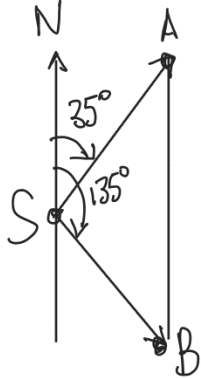
$$\text{sin formula: } \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\text{cosine formula: } a^2 = b^2 + c^2 - 2bc \cos A$$

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

Two - Dimensional Problems

Example : Bearings of A and B from S are 35° and 135°
If $SA = 390\text{ m}$ and $SB = 280\text{ m}$, find AB



Answer : $AB^2 = SA^2 + SB^2 - 2(SA)(SB)\cos\angle ASB$

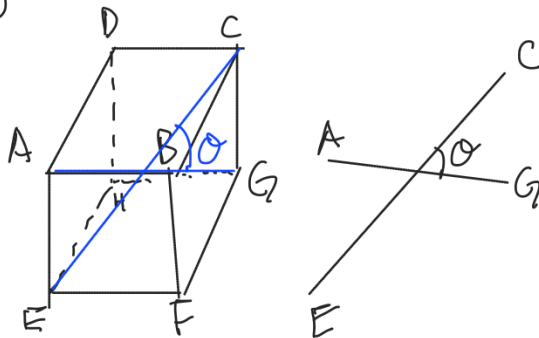
$$AB = \sqrt{390^2 + 280^2 - 2(390)(280)\cos(135^\circ - 35^\circ)}$$

$$= \underline{\underline{518\text{ m}}}$$

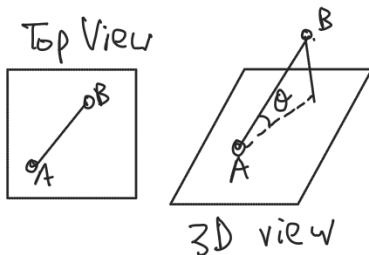
Lines, Angles and Distances in 3D

Angles between the 2 lines :

If not specified, the acute angle (less than 90°) is taken as the angle of the 2 lines



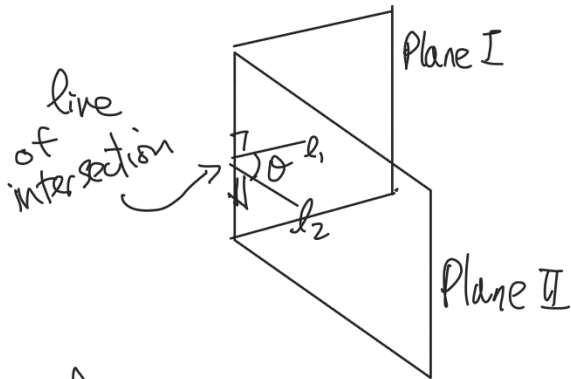
Acute angle between a line and a plane



The acute angle between a line and a plane is the angle between the straight line and the plane

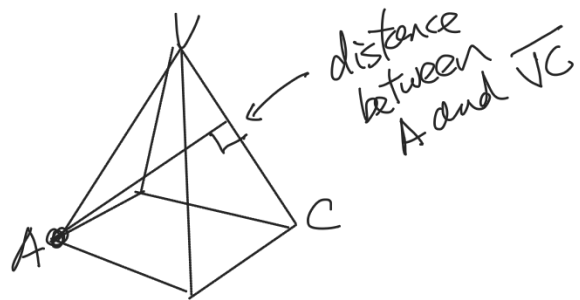
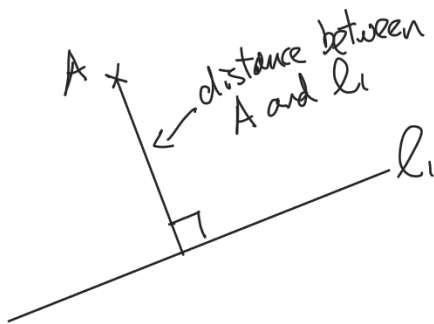
Angle between 2 planes

If l_1 and l_2 are lines on plane I and plane II respectively. If 2 lines are perpendicular to the intersection, the angle θ between l_1 and l_2 is the angle between plane I and plane II.



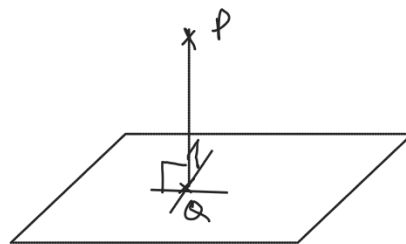
Distance between a Point and a Straight Line

The distance between a point and a straight line is the perpendicular distance between the point and line.



Distance between a Point and a Plane

Distance between a point and a plane is the perpendicular distance between the point and the plane.



Line of greatest slope

The inclined plane $ABCD$, CD is the line of intersection.

If $HK \perp CD$ lies on $ABCD$, then HK is the line of greatest slope of $ABCD$

