



$$\sin A = \frac{l}{h} \quad (1)$$

$$\implies l = h \sin A \quad (2)$$

$$\cos B = \frac{l}{r} \quad (3)$$

$$\implies r = \frac{l}{\cos B} \quad (4)$$

$$= \frac{h \sin A}{\cos B} \quad (5)$$

$$\cos A = \frac{p}{h} \quad (6)$$

$$\implies p = h \cos A \quad (7)$$

$$\tan B = \frac{t}{l} \quad (8)$$

$$\implies t = l \tan B \quad (9)$$

$$= h \sin A \tan B \quad (10)$$

$$\cos B = \frac{b}{q} \quad (11)$$

$$\implies q = \frac{b}{\cos B} \quad (12)$$

$$q + t = p \quad (13)$$

$$\implies \frac{b}{\cos B} + h \sin A \tan B = h \cos A \quad (14)$$

$$\frac{b}{\cos B} + l \sin A \left(\frac{\sin B}{\cos B} \right) = h \cos A \quad (15)$$

$$b + h \sin A \sin B = h \cos A \cos B \quad (16)$$

$$\frac{b}{h} + \sin A \sin B = \cos A \cos B \quad (17)$$

$$\implies \cos(A + B) + \sin A \sin B = \cos A \cos B \quad (18)$$

$$\implies \cos(A + B) = \cos A \cos B - \sin A \sin B \quad (19)$$

$$\sin(A + B) = \cos(90^\circ - (A + B)) \quad (20)$$

$$= \cos((90^\circ - A) - B) \quad (21)$$

$$= \cos(90^\circ - A) \cos(-B) - \sin(90^\circ - A) \sin(-B) \quad (22)$$

$$\implies \sin(A + B) = \sin A \cos B + \cos A \sin B \quad (23)$$