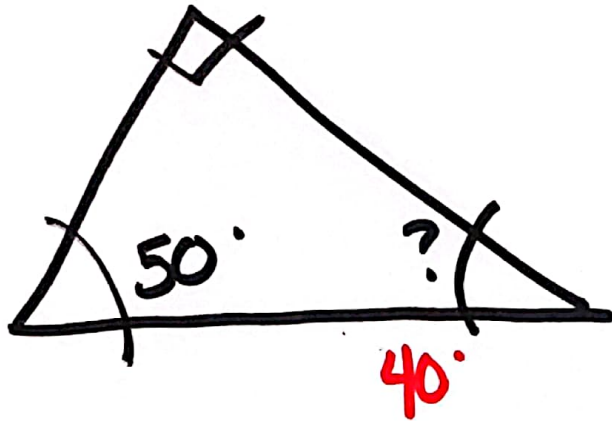
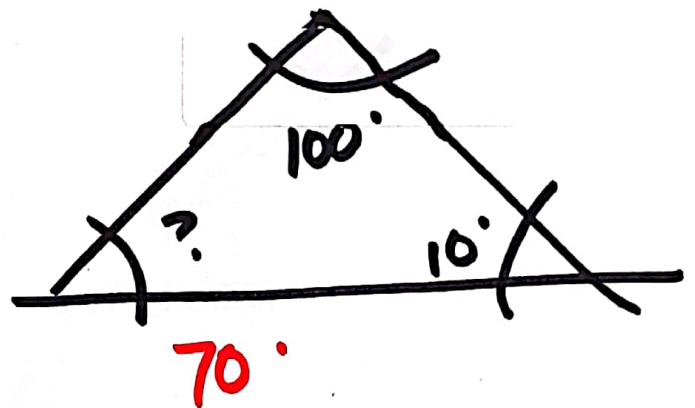
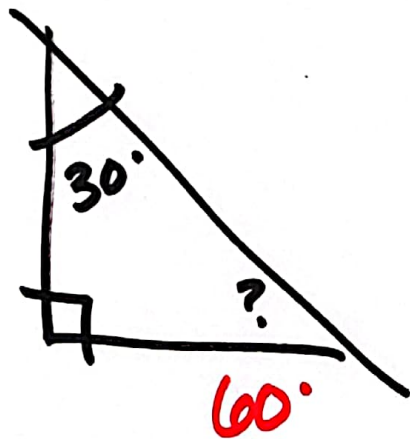


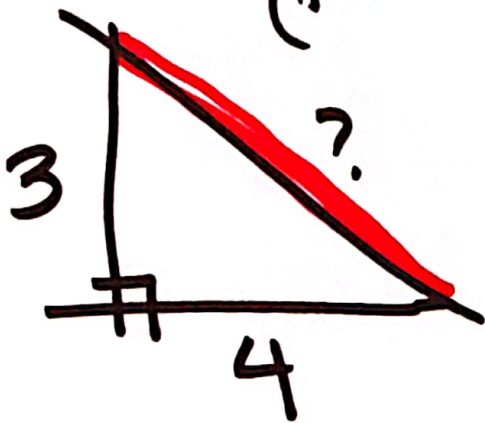
Trigonometry Session #2



Sum of all
angles in any
triangle = 180° .



Pyth. theorem: $c^2 = a^2 + b^2$
 (for right Δ 's)

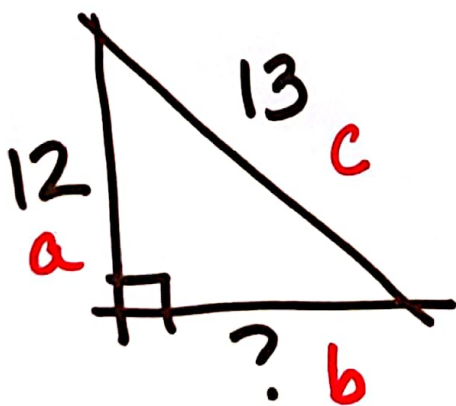


$$c^2 = 3^2 + 4^2$$

$$c^2 = 9 + 16$$

$$\sqrt{c^2} = \sqrt{25}$$

$$\boxed{c = 5}$$



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

$$b^2 = c^2 - a^2$$

$$b^2 = 13^2 - 12^2$$

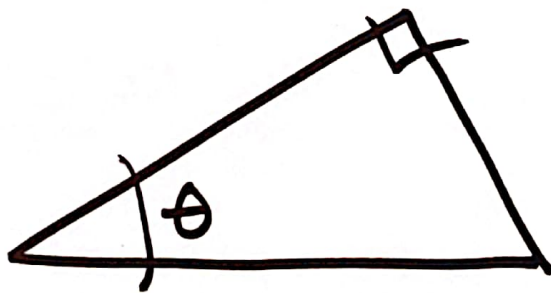
$$b^2 = 169 - 144$$

$$\sqrt{b^2} = \sqrt{25}$$

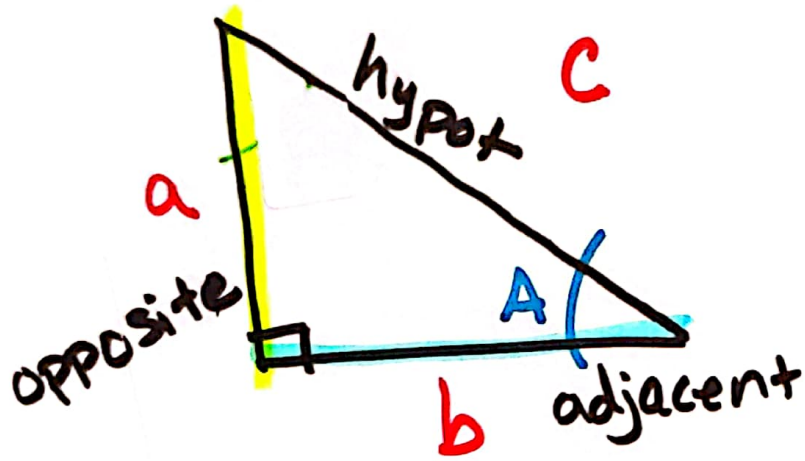
$$\boxed{b = 5}$$

Sin (sine) + cos (cosine)
are trig of an angle.

Triangles have special
relationships we can write
that relate the Δ 's
with the sides.



Trig Ratios:

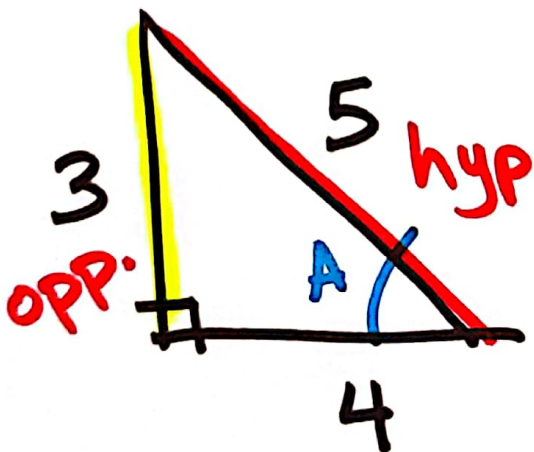


$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\sin A = \frac{a}{c}$$

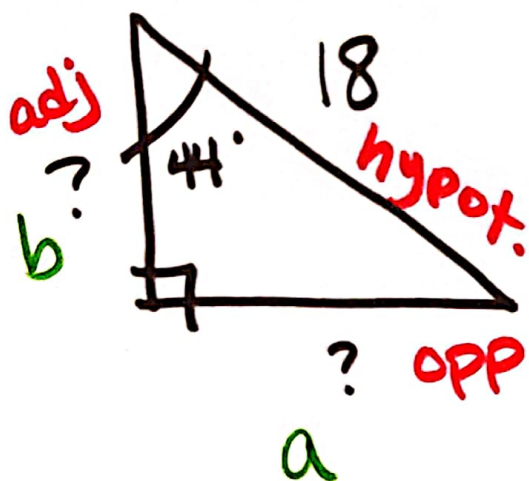
$$\cos A = \frac{\text{adj}}{\text{hyp}}$$

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



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

$$\sin A = \frac{3}{5}$$



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

$$18 \sin 44^\circ = \frac{a}{18} \cdot 18$$

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

$$\cos 44^\circ = \frac{b}{18}$$

$$b = 18 \cos 44^\circ$$

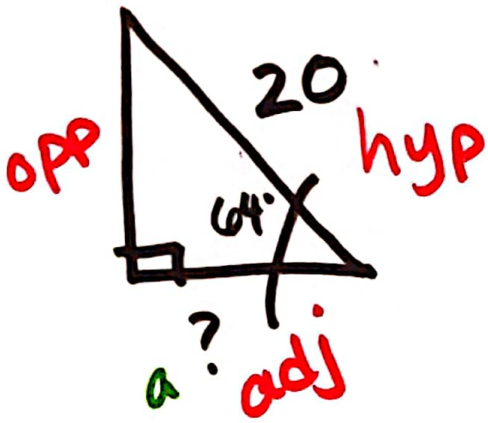
$$b = 18(0.719)$$

$$b = 12.95$$

$$a = 18 \cdot \sin 44^\circ$$

$$a = 18(0.695)$$

$$a = 12.5$$



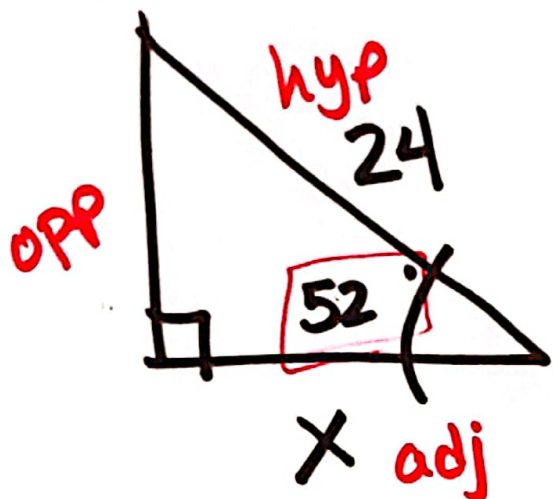
$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

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

$$\cos 64^\circ = \frac{a}{20}$$

$$a = 20 \cdot \cos 64^\circ$$

$$a = 8.77$$



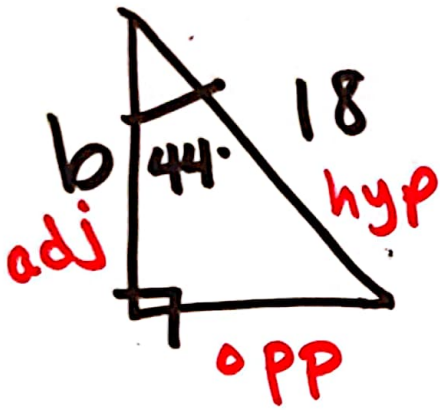
$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

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

$$\cos 52^\circ = \frac{x}{24}$$

$$x = 24 \cdot \cos 52^\circ$$

$$x = 14.8$$



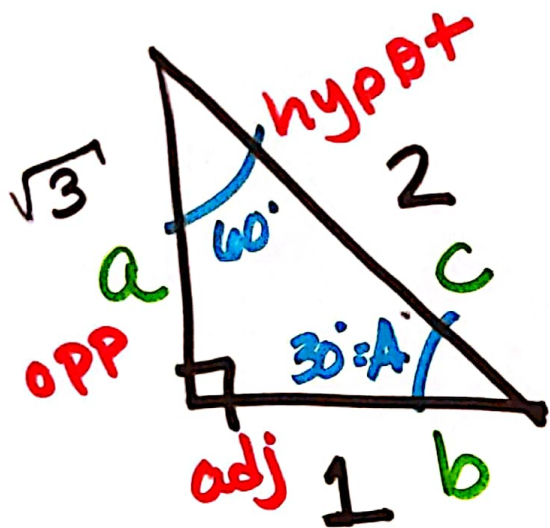
$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

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

$$\cos 44^\circ = \frac{b}{18}$$

$$b = 18 \cos 44^\circ$$

$$b = 12.95$$



① Pyth. Thm:

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

$$2^2 = a^2 + 1^2$$

$$4 = a^2 + 1$$

$$a^2 = 4 - 1 = 3$$

$$a = \sqrt{3}$$

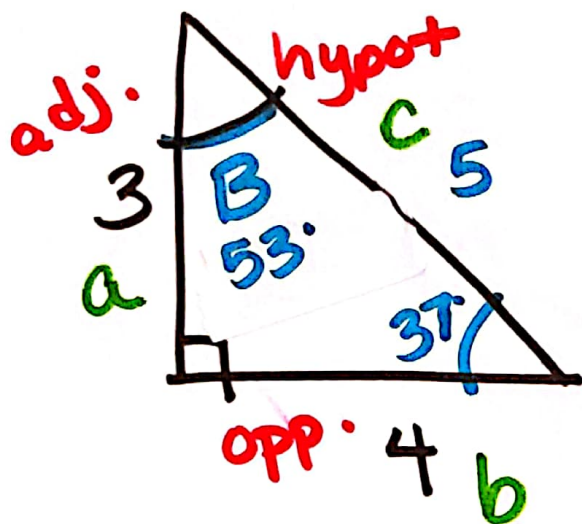
② $\cos A = \frac{\text{adj}}{\text{hyp.}}$

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

$$A = \cos^{-1}\left(\frac{1}{2}\right) = \underline{\underline{30^\circ}}$$

$$\left. \begin{array}{l} \cos \\ \text{arc cos} \end{array} \right\} \cos^{-1}$$

③ $\angle B: 180^\circ - 90^\circ - 30^\circ = \underline{\underline{60^\circ}}$



① Pyth. Thm.

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

$$c^2 = 3^2 + 4^2$$

$$c^2 = 9 + 16$$

$$\sqrt{c^2} = \sqrt{25}$$

$$c = 5$$

$$\textcircled{2} \sin B = \frac{\text{opp}}{\text{hyp}}$$

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

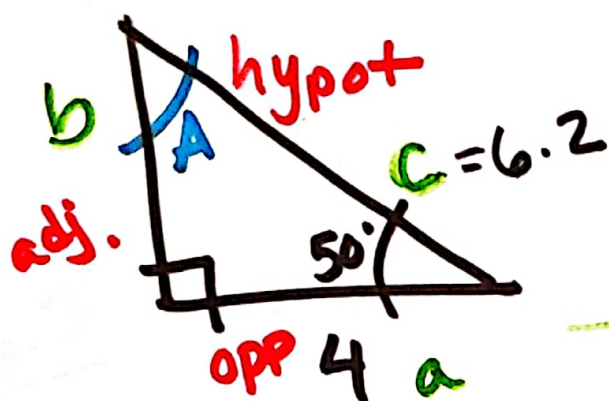
$$\sin B = \frac{4}{5}$$

$$B = \sin^{-1}\left(\frac{4}{5}\right) = 53.1^\circ$$

③ $\text{Sum } \angle = 180^\circ$

$$\angle A = 180^\circ - 90^\circ - 53.1^\circ$$

$$\angle A = 37^\circ$$



① Sum of angles = 180°

$$180^\circ - 50^\circ - 90^\circ = \boxed{40^\circ}$$

② $\sin A = \frac{\text{opp}}{\text{hyp}}$

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

$$\sin 40^\circ = \frac{4}{c}$$

$$c = \frac{4}{\sin 40^\circ} = \frac{4}{0.64279\dots} = \boxed{6.2}$$

③ Pyth. Thm: OR Trig fn:

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

$$(6.2)^2 = 4^2 + b^2$$

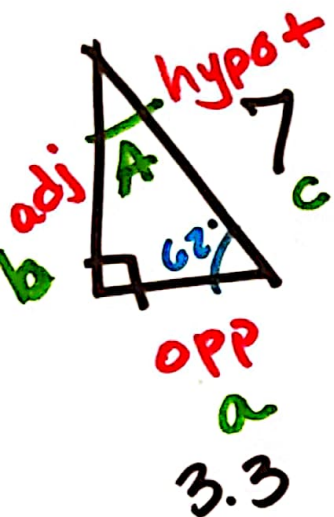
$$b^2 = 6.2^2 - 4^2 = 22.4$$

$$\boxed{b = 4.7}$$

$$\cos 40^\circ = \frac{b}{6.2}$$

$$b = 6.2 \cdot \cos 40^\circ$$

$$\boxed{b = 4.7}$$



① Sum Δ 's in $\Delta = 180^\circ$

$$\angle A = 180^\circ - 90^\circ - 62^\circ = \boxed{28^\circ} \quad \angle A$$

② use trig ratio: (to get "a")

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

$$\sin 28^\circ = \frac{a}{7}$$

$$a = 7 \sin 28^\circ = \boxed{3.3} \quad a$$

③ Pyth. Thm: $c^2 = a^2 + b^2$

$$7^2 = 3.3^2 + b^2$$

$$49 - 10.8 = b^2$$

$$b^2 = 38.2 \rightarrow \boxed{b = 6.2}$$