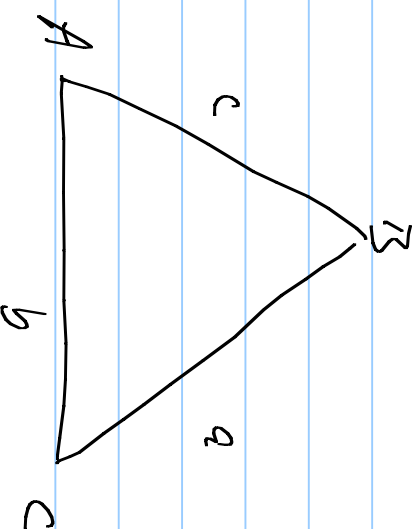


COSINE LAW

- IN ANY TRIANGLE



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

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

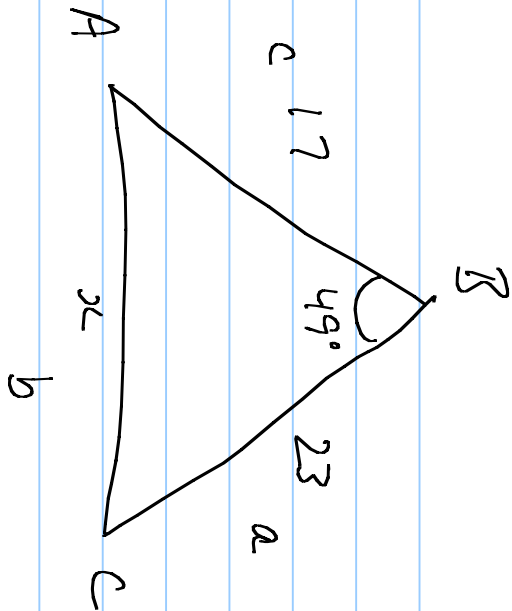
RECALL: WHEN WE USE THE SINE LAW WE NEED

AN ANGLE AND ITS OPPOSITE SIDE.

- WHEN WE KNOW TWO SIDES AND THE ANGLE BETWEEN THEM (CONTAINED ANGLE), WE USE THE COSINE LAW TO FIND THE LENGTH OF THE SIDE ACROSS FROM THE ANGLE WE KNOW.

- WHEN WE KNOW THE LENGTHS OF ALL 3 SIDES WE CAN USE THE COSINE LAW TO FIND THE MISSING ANGLES.

2E



$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$x^2 = 23^2 + 17^2 - 2(23)(17) \cos 49$$

$$x^2 = 529 + 289 - \underbrace{782}_{\downarrow} \underbrace{(.656)}_{\downarrow}$$

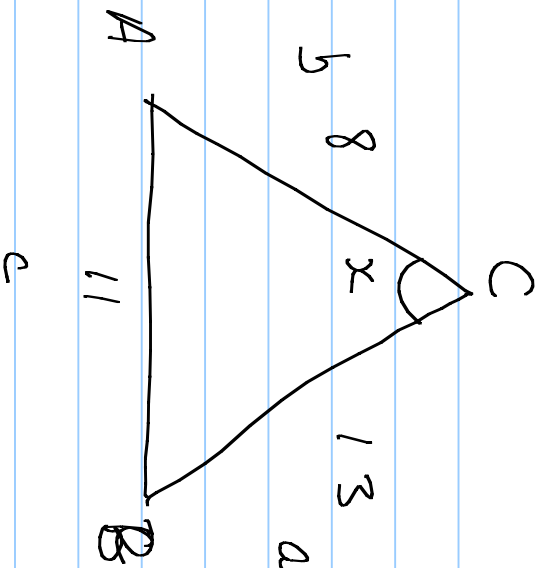
$$x^2 = 529 + 289 - 512.992$$

$$x^2 = 305.008$$

$$x = \sqrt{305.008}$$

$$x = 17.46$$

IE



$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$11^2 = 13^2 + 8^2 - 2(13)(8) \cos x$$

$$121 = 169 + 64 - 208 \cos x$$

$$121 = 233 - 208 \cos x$$
$$-233 \quad -233$$

$$\frac{-112}{-208} = \frac{-208 \cos x}{-208}$$

Ru 192

$$0.538 = \cos x$$

1-9, 12 ALL!!

$$\cos^{-1} 0.538 = 57^\circ$$

