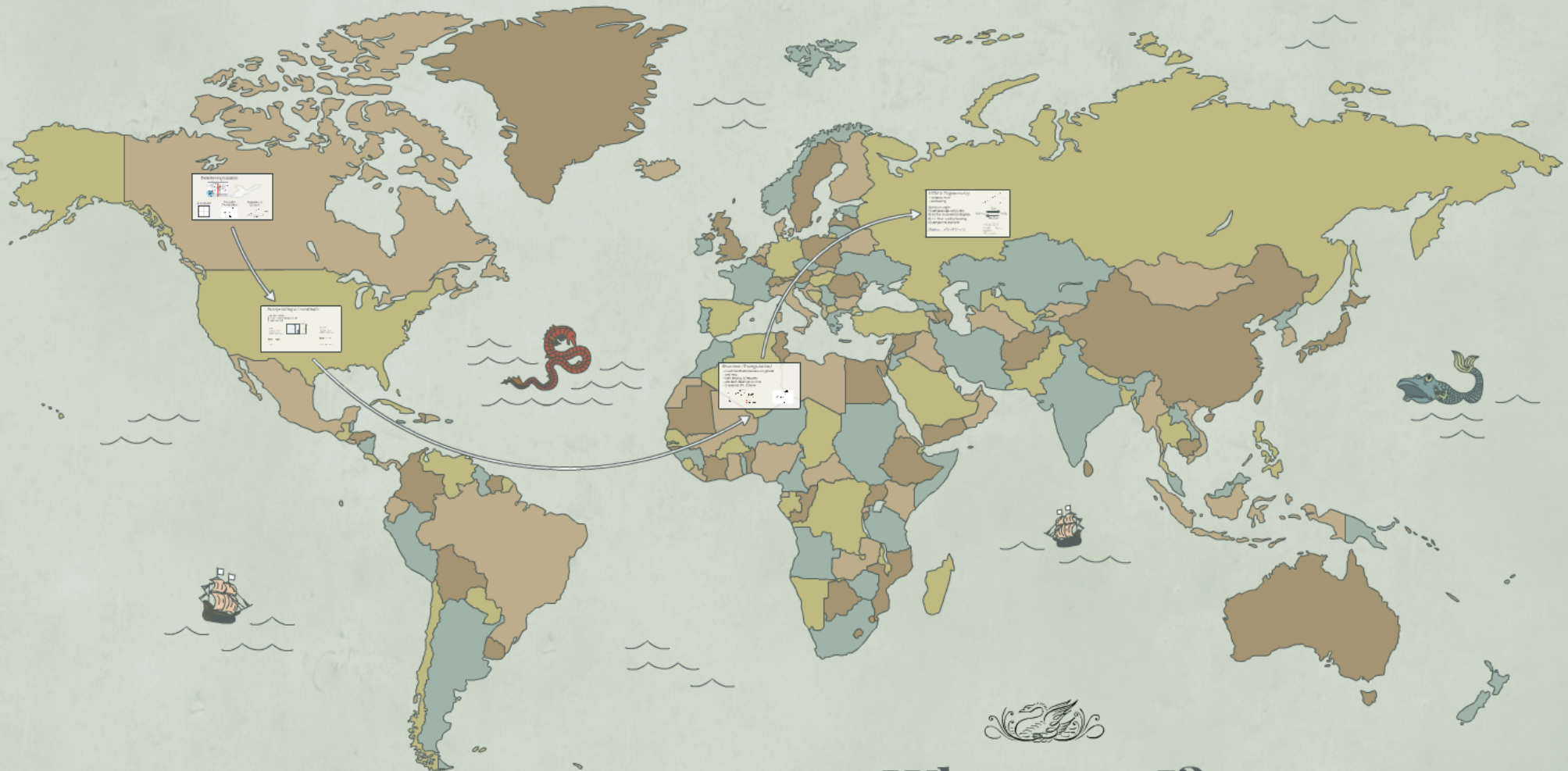


## Where am I?

*interpolation, triangulation, trigonometry*

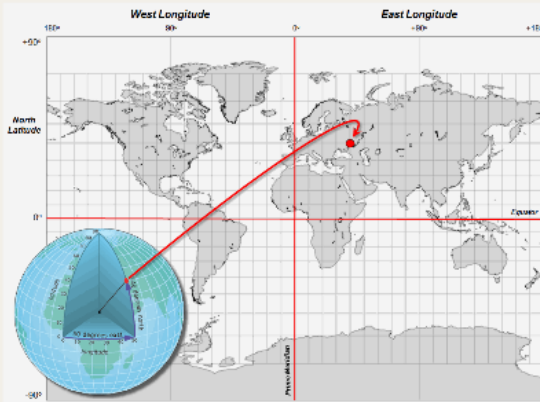


# Where am I?

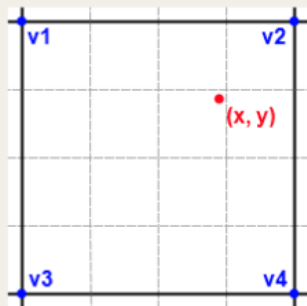
*interpolation, triangulation, trigonometry*



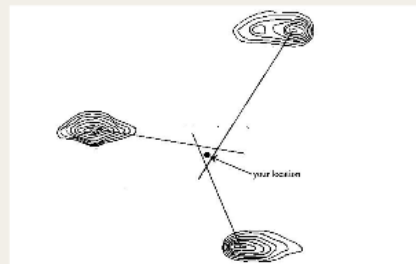
# Determining Location



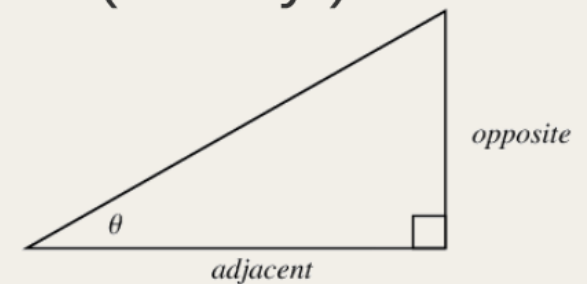
## Interpolation



## Resection (Triangulation)



## Trigonometry (oh boy!)



# Interpolating a Coordinate

2 Similar Methods:

a) ratios - cross-multiply & divide

b) proportion (%)

a) ratios

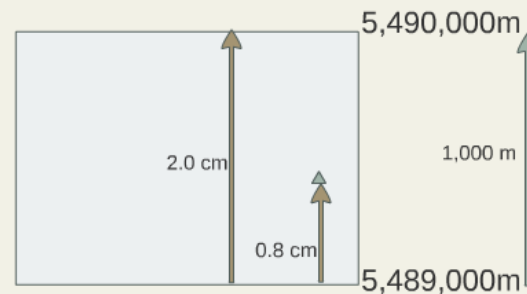
"map" short = 0.8 cm

"map" long = 2.0 cm

"real world" long = 1,000 m

$$\frac{0.8 \text{ cm}}{2.0 \text{ cm}} = \frac{? \text{ m}}{1,000 \text{ m}}$$

$$? = 400 \text{ m}$$



b) proportion

"map" short = 0.8 cm

"map" long = 2.0 cm

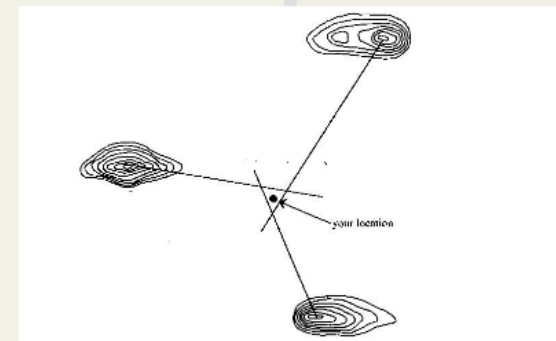
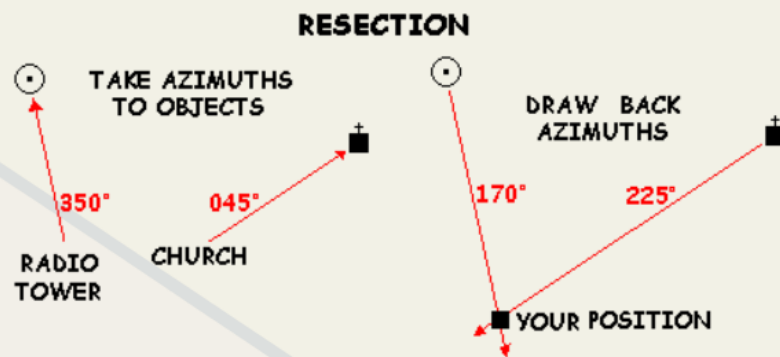
"real world" long = 1,000m

$$\frac{0.8 \text{ cm}}{2.0 \text{ cm}} = 0.40 \text{ (40\%)}$$

$$40\% \text{ of } 1,000\text{m} = 400 \text{ m}$$

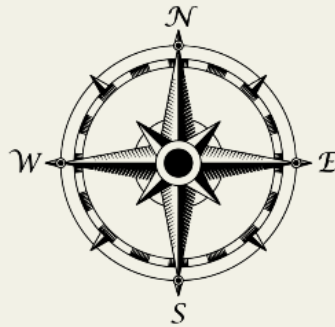
# *Resection (Triangulation)*

- need identifiable features on ground and map
- take bearing to features
- plot back-bearings on map
- 2 features OK, 3 better



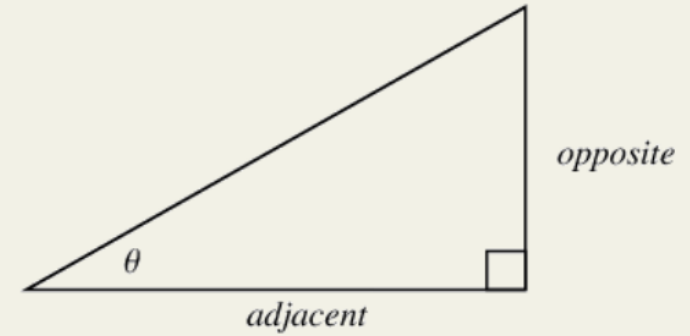
# UTM & Trigonometry

- compass rose
- est.bearing

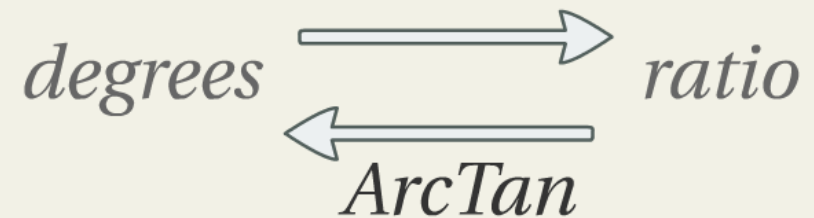


- 1) pick an angle
- 2) compute opp./adj (ratio)
- 3) ArcTan to convert to degrees
- 4) + / - from cardinal bearing
- 5) compare to estimate

*Distance ...  $a^2 + b^2 = c^2$*



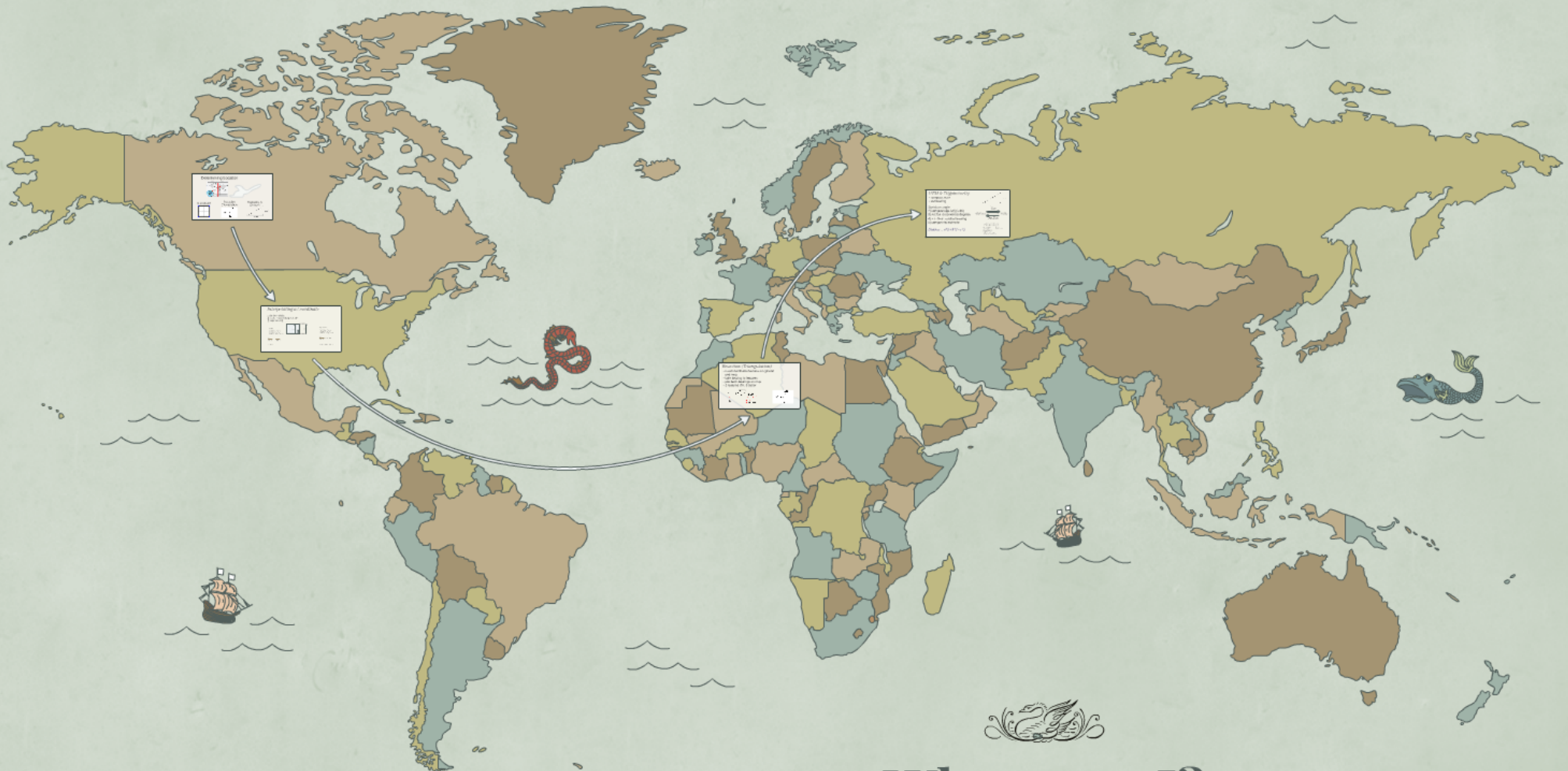
*Tan*



*A = 410,150m E 5,455,210m N*

*B = 410,090m E 5,455,250m N*

- draw & label box *distance*
- pick an angle  *$\sqrt{a^2 + b^2}$*
- draw compass rose
- determine ratio
- ArcTan the ratio = degrees
- + / - from cardinal bearing



# Where am I?

*interpolation, triangulation, trigonometry*

