



College of Engineering and Food Science
Department of Agricultural and Biosystems Engineering

Surveying (GEN 110)
Practice Exercise No. 3

NAME: Jairah A. Mercado **DATE: _____**

1. A surveying student had recorded the following after repeated pacing:
First distance = 100 m
No. of paces: 150, 149, 150.5, 148.75
Second distance =?
No. of paces: 893.5, 896, 891.5, 897
Find the second distance in meters. Round off the answer in 3 significant figures.

$$P.F. = \frac{\text{Length}}{\text{No. of Paces}}$$

$$P.F. = \frac{100\text{ m}}{150 + 149 + 150.5 + 148.75}$$

$$P.F. = \frac{100\text{ m}}{598}$$

$$P.F. = 0.167 \approx 0.2$$

$$P.F. (\text{No. of Paces}) = \text{Length}$$

$$\text{Length} = (0.2)(893.5 + 896 + 891.5 + 897)$$

$$\text{Length} = (0.2)(3578)$$

$$\text{Length} = 715.6 \approx 716\text{ m}$$

The second distance is 716 m.

2. With the transit at point A and line of sight horizontal, the stadia intercept at B is 0.6 m. If the stadia interval factor is 99.96 and the additive factor is 0.3, find the distance AB.

$$D = Ks + C$$

$$D = (99.96)(0.6) + (0.3)$$

$$D = (60) + (0.3)$$

$$D = 60\text{ m}$$

3. After covering the distance from the NSB Building to the Infirmary Building, the wheel has a diameter of 0.15 m. The odometer registered 1550 complete revolutions between two buildings. If the ground is even, what is the distance between NSB and Infirmary building?

$$r = \frac{\text{diameter}}{2} = \frac{0.15}{2} = 0.075 \text{ m}$$

$$D = 2\pi r (\text{No. of Revolution})$$

$$D = (2\pi(0.075 \text{ m}))(1550)$$

$$D = (0.47)(1550)$$

$$D = 728.5 \approx 730 \text{ m}$$

The distance between NSB and Infirmary Building is 730 m (2 significant figures).

4. A local map of the municipality of Pili has a scale of 1:5000. Using a ruler, the distance between the CBSUA to CWC Complex is 0.0082m.
- a. What is the actual distance between the two places?

$$1:5000 \rightarrow 1 \text{ cm} = 50 \text{ m}$$

$$0.0082 \times 100 = 0.82 \text{ cm}$$

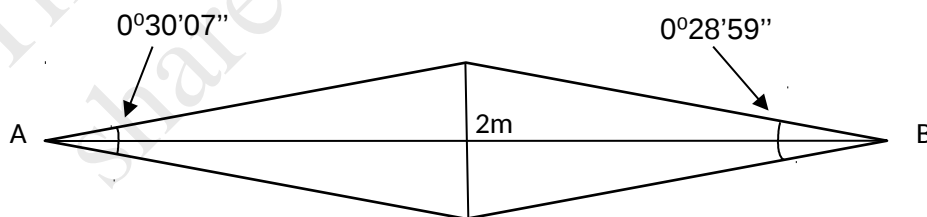
$$5000 \times 0.82 = 41,000 \text{ m} \rightarrow \text{actual distance between two places.}$$

- b. Using the ruler again, the distance between Pili and Naga is 2.62 cm. What is the actual distance between the places in m?

$$2.62 \left(\frac{1 \text{ m}}{100 \text{ cm}} \right) = 0.0262 \text{ m}$$

$$0.0262 \times 100 = 2.62 \times 5000 = 13,100 \text{ m} \rightarrow \text{actual distance}$$

5. A subtense bar is set up near the middle of a line AB. Using a theodolite set up at A, the angle subtended reads $0^{\circ}30'07''$. When the Theodolite is transferred and set up at B, the corresponding subtended angle was observed as $0^{\circ}28'59''$. Determine the horizontal length of line AB. (Let's assume that the subtense bar is 2 meters long, since there is no given length)



$$D_A = \cot \frac{\theta}{2}$$

$$D = \frac{1}{\tan \frac{\theta}{2}}$$

$0^\circ 30' 07''$ over $\{2\}$

$$D = \frac{1}{\tan \frac{\theta}{2}}$$

$$D_A = 228.29 \text{ m}$$

$$D_B = \frac{1}{\tan \frac{\theta}{2}}$$

$0^\circ 28' 59''$ over $\{2\}$

$$D = \frac{1}{\tan \frac{\theta}{2}}$$

$$D_B = 237.22 \text{ m}$$

$$D_{AB} = D_A + D_B$$

$$D_{AB} = 228.29 \text{ m} + 237.22 \text{ m}$$

$$D_{AB} = 465.51 \text{ m}$$

This study resource was shared via CourseHero.com