Republic of the Philippines
**CENTRAL BICOL STATE UNIVERSITY OF AGRICULTURE**
San Jose, Pili, Camarines Sur 4418
www.cbsua.edu.ph

**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.

$$P.F. = \frac{Length}{No.\ of\ Paces}$$
$$P.F. = \frac{100\,m}{150+149+150.5+148.75}$$
$$P.F. = \frac{100\,m}{598}$$
$$P.F. = 0.167 \approx 0.2$$
$$P.F.(No.\ of\ Paces) = Length$$
$$Length = (0.2)(893.5+896+891.5+897)$$
$$Length = (0.2)(3578)$$
$$Length = 715.6 \approx 716\,m$$

   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.

$$D = Ks + C$$
$$D = (99.96)(0.6) + (0.3)$$
$$D = (60) + (0.3)$$
$$D = 60\,m$$

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?

$$r = \frac{diameter}{2} = \frac{0.15}{2} = 0.075\,m$$
$$D = 2\pi r(No.\,of\ Revolution)$$
$$D = (2\pi(0.075\,m))(1550)$$
$$D = (0.47)(1550)$$
$$D = 728.5 \approx 730\,m$$

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

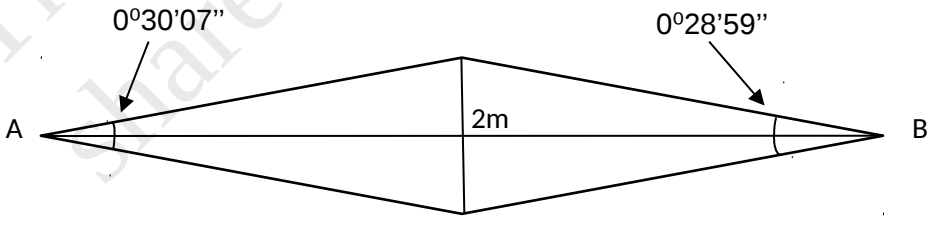
4. A local map of the municipality of Pili has a scale of 1:5000. Using a ruler, the distance between the CBSUA to CWC Complex is 0.0082m.
   a. What is the actual distance between the two places?

$$1:5000 \rightarrow 1cm = 50\,m$$
$$0.0082\,x\,100 = 0.82\,cm$$
$$5000\,x\,0.82 = 41{,}000\,m \rightarrow actual\ distance\ between\ two\ places.$$

   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?

$$2.62\left(\frac{1\,m}{100\,cm}\right) = 0.0262\,m$$
$$0.0262\,x\,100 = 2.62\,x\,5000 = 13{,}100\,m \rightarrow actual\ distance$$

*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°30'07". When the Theodolite is transferred and set up at B, the corresponding subtended angle was observed as 0°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)*



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

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

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

$$\tan ¿$$

$$D = \frac{1}{¿}$$

$$D_A = 228.29\,m$$

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

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

$$\tan ¿$$

$$D = \frac{1}{¿}$$

$$D_B = 237.22\,m$$

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

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

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