Lab 2

Horizontal Measurement

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OBJECTIVE

The objectives of this lab were to learn how to calculate 90% error, measure our pace distances and use the law of cosines to compute the angles that were formed during our measurements. This lab also was used to teach us the proper way to measure distances with a tape.

EQUIPMENT

Steel Tape

Plumb Bob

Nails

TEMPERATURE

92 degrees F

PACING CALCULATIONS

Pacing from 1 to 2

|  |  |  |
| --- | --- | --- |
| 31 | 30.6 | 0.4 |
| 29 | 30.6 | 1.6 |
| 32 | 30.6 | 1.4 |
| 31 | 30.6 | 0.4 |
| 30 | 30.6 | 0.6 |

$$1.645×\sqrt{\frac{4.4}{20}}=\pm 0.77$$

Pacing from 2 to 3

|  |  |  |
| --- | --- | --- |
| 30 | 30.5 | 0.5 |
| 31 | 30.5 | 0.5 |
| 30.5 | 30.5 | 0 |
| 32 | 30.5 | 1.5 |
| 29 | 30.5 | 0.5 |

$$1.645× \sqrt{\frac{3}{20}}= \pm 0.64$$

Pacing from 3 to 1

|  |  |  |
| --- | --- | --- |
| 34.5 | 34.3 | 0.2 |
| 35 | 34.3 | 0.7 |
| 33 | 34.3 | 1.3 |
| 34 | 34.3 | 0.3 |
| 35 | 34.3 | 0.7 |

$$1.645 × \sqrt{\frac{3.2}{20}} = \pm 0.658$$

LAW OF COSINES



ERROR MEASUREMENTS

From 1-2

$$0.00000645 \left(92-68\right)\left(81.83\right)=0.012667 ft$$

From 2-3

$$0.00000645 \left(92-68\right)\left(77.26\right)=0.0119598 ft$$

From 3-1

$$0.00000645 \left(92-68\right)\left(89.20\right)=0.01380816 ft$$

CONCLUSION

This lab was very simple, but it took us a while to complete. We had some trouble measuring on a hill. It was also difficult because we had to start over on it once, because we weren’t able to complete it in one day. I believe that we did everything correctly.