

CVG 2171 – Assignment 3 Solution

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6.9 **124.74 ft;**

$$C_L = \frac{99.992 - 100}{100} 124.73 = -0.010; C_T = 0.00000645(85 - 68)124.73 = 0.014 \text{ ft}$$

$$C_P = (15 - 12) \frac{124.73}{0.0025(29,000,000)} = 0.005 \text{ ft}$$

6.11 **94.21 ft;**

$$C_L = \frac{99.992 - 100}{100} 94.23 = -0.008; C_T = 0.00000645(75 - 68)94.23 = 0.004 \text{ ft}$$

$$C_P = (25 - 12) \frac{94.23}{0.0025(29,000,000)} = 0.017 \text{ ft}; C_S = -\frac{0.023^2(94.23)^3}{24(25)^2} = -0.029 \text{ ft}$$

6.15 **16.294 m;**

$$C_L = \frac{29.991 - 30}{30} 16.302 = -0.005; C_T = 0.0000116(25 - 20)16.302 = 0.0009 \text{ m}$$

$$C_P = (7.9 - 5.5) \frac{16.302}{0.016(2,000,000)} = 0.0012 \text{ m}; C_S = -0.0407^2 \times 16.302^3 / (24 \times 7.9^2) = -0.0048$$

6.17 **68.95 ft;**

$$C_L = \frac{100.008 - 100}{100} 68.96 = 0.006; C_T = 0.00000645(54 - 68)68.96 = -0.006 \text{ ft}$$

$$C_P = (20 - 12) \frac{68.96}{0.0025(29,000,000)} = 0.008 \text{ ft}$$

6.19\* When measuring a distance AB, the first taping pin was placed 1.0 ft to the right of line AB and the second pin was set 0.5 ft left of line AB. The recorded distance was 236.89 ft. Calculate the corrected distance. (Assume three taped segments, the first two 100 ft each.)

**236.87 ft**

$$\text{A-Pin1: } \sqrt{100^2 - 1^2} = 99.995 \text{ ft}; \text{ Pin1-Pin2: } \sqrt{100^2 - (1 + 0.5)^2} = 99.989 \text{ ft}$$

$$\text{Pin1-B: } \sqrt{36.89^2 - 0.5^2} = 36.887 \text{ ft}; AB = 99.995 + 99.989 + 36.887 = 236.870 \text{ ft}$$