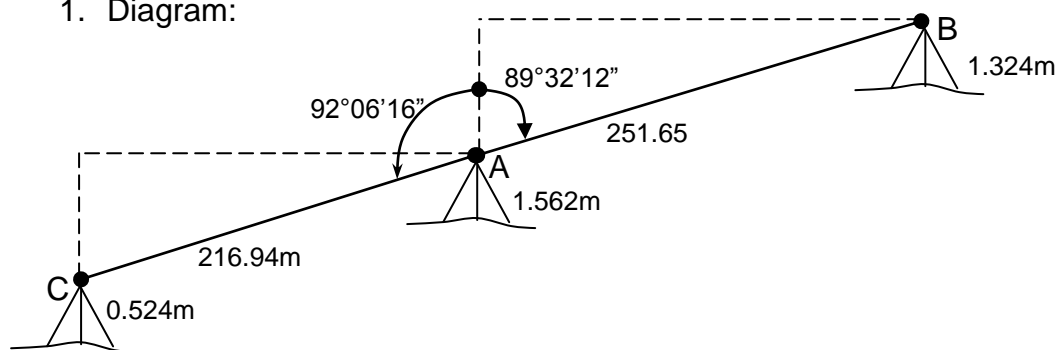


# MATHEMATICS ANSWERS

## Level Two

### Trig Heights #5

1. Diagram:



**Note:** The height of the ground at A is 156.66 m. The height of the measurement instrument at A is thus 156.66 m + 1.562 m = 158.222 m.

$$2. \quad A \text{ to } B = 251.65 \sin 89^{\circ}32'12'' \\ = 251.642\text{m}$$

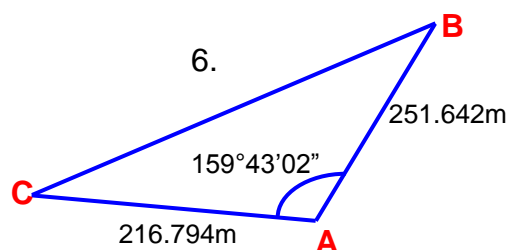
$$A \text{ to } C = \cos (2^{\circ}06'16'') \times 216.94\text{m} \\ h = 216.794\text{m}$$

$$3. \quad \text{Change in height A to B} = \cos (89^{\circ}32'12'') \times 251.65 = 2.035\text{m} \\ 2.035 + 1.562 - 1.324 = 2.273\text{m between marks at A and B}$$

$$\text{Change in height A to C} = -\sin (2^{\circ}06'16'') \times 216.94 = -7.966\text{m} \\ -7.966 + 1.562 - 0.524 = -6.928\text{m between marks at A and C}$$

$$4. \quad 2.273 + 6.928 = 9.201\text{m}$$

$$5. \quad \text{Elevation at A} = 156.66 \Rightarrow B = 158.933\text{m above mean sea level} \\ \Rightarrow C = 149.732\text{m above mean sea level}$$



$$a^2 = b^2 + c^2 - 2abc \cos C \\ a^2 = (251.642)^2 + (216.794)^2 - 2 \times 251.642 \times 216.794 \\ \times \cos(159^{\circ}43'02'') \\ a = 461.158 \text{ m} \Rightarrow BC = 461.158 \text{ m long}$$