



# Introduction to Trigonometry with Applications

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APPLICATION EXAMPLE – PISTON LOCATION IN INTERNAL COMBUSTION  
ENGINE

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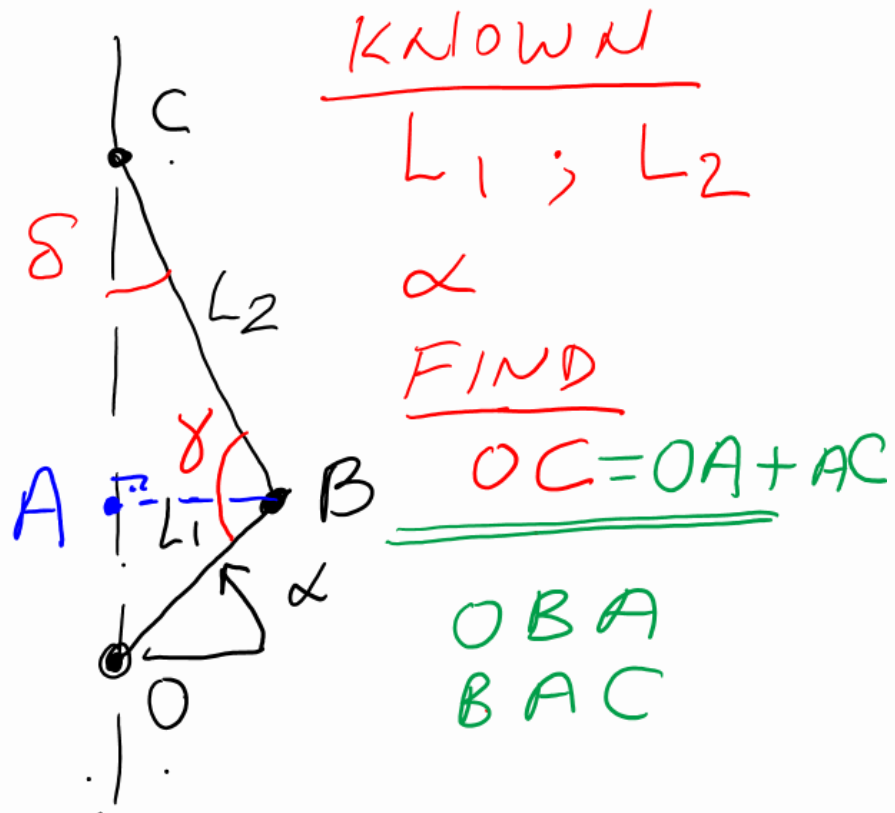
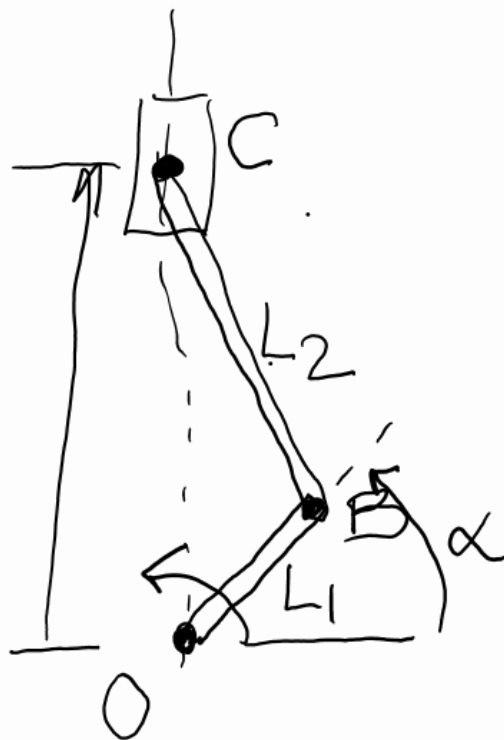
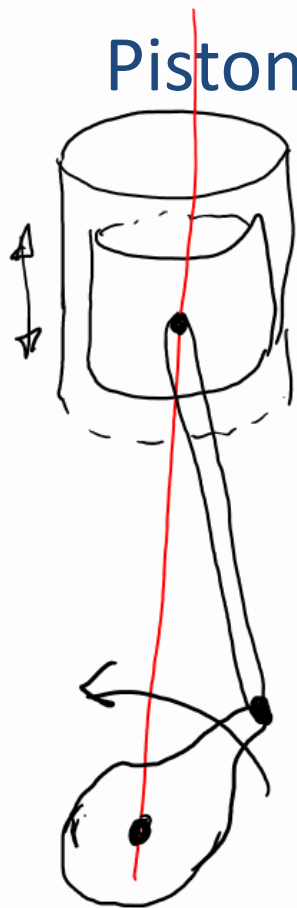
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# Application Example

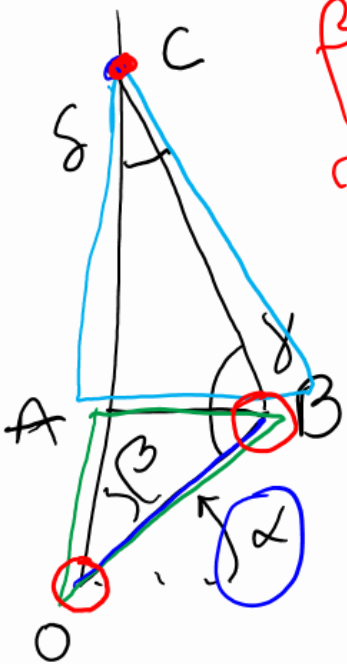
## Piston Location of an Internal Combustion Engine





# Application Example

## Piston Location of an Internal Combustion Engine



$$\beta = 90 - \alpha$$

$$\cos(\beta) = \frac{OA}{OB} = \frac{OA}{L_1} \Rightarrow OA = L_1 * \cos(\beta)$$

$$\sin(\delta) = \frac{AB}{BC} = \frac{AB}{L_2} = \frac{L_1 * \sin(\beta)}{L_2} \Rightarrow S \text{ known}$$

$$\sin(\beta) = \frac{AB}{OB} \Rightarrow AB = L_1 * \sin(\beta)$$

$$\cos(\delta) = \frac{AC}{BC} \Rightarrow AC = L_2 * \cos(\delta)$$

$$OC = OA + AC = L_1 * \cos(\beta) + L_2 * \cos(\delta)$$