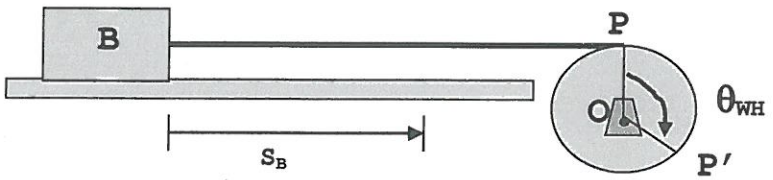
Work Energy I - Problem 2
In each of the cases below, the wheel undergoes an angular displacement. Determine the horizontal displacement of the block, S_B.

Case 1: RAFA

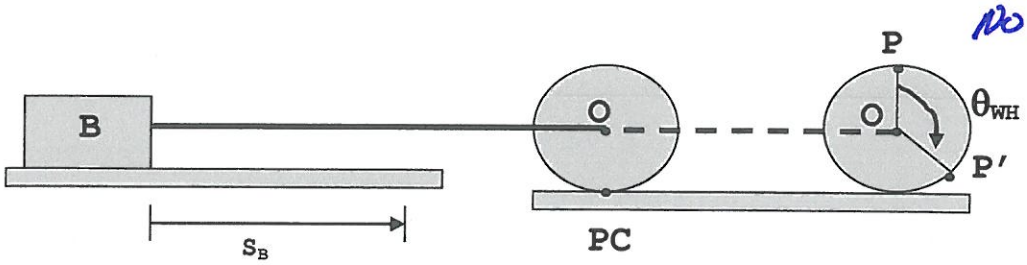
RAFA



$$S_B = S_P = \theta_{wh} r_{P/O}$$

Case 2: Center of Rolling No-Slip Wheel

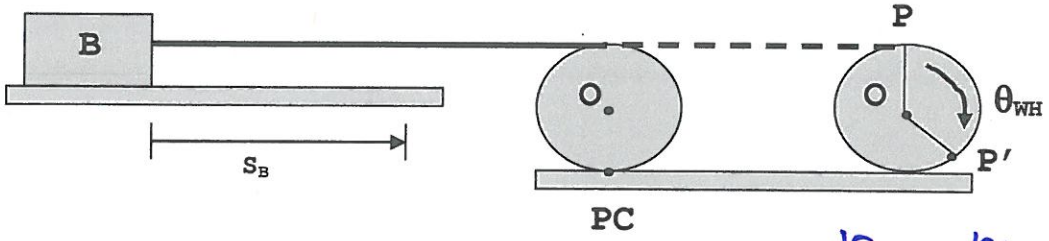
GPM
NO SLIP WHEEL



$$S_B = S_O = \theta_{wh} r_{O/PC}$$

Case 3: Non-Center of Rolling No-Slip Wheel

GPM
NO SLIP



$r_{O/PC} = r_{P/O} = r_{wh}$

$$S_B = S_P = S_O + S_{P/O}$$

$$= \theta_{wh} r_{O/PC} + \theta_{wh} r_{P/O} = 2\theta_{wh} r_{wh}$$