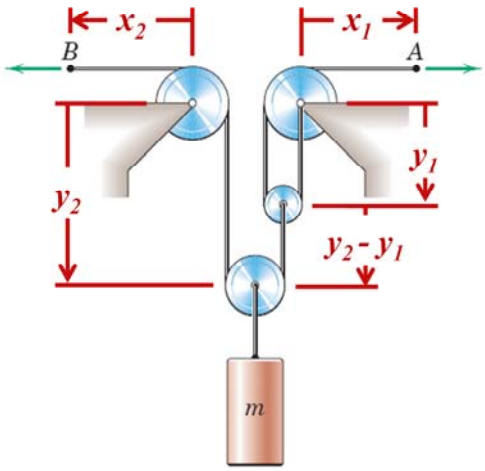
Two Degrees of Freedom: Exercise



Each of the cables at ***A*** and ***B*** is given a ***velocity*** of 2 m/s in the direction of the arrow.

Determine the upward ***velocity*** of load ***m***.

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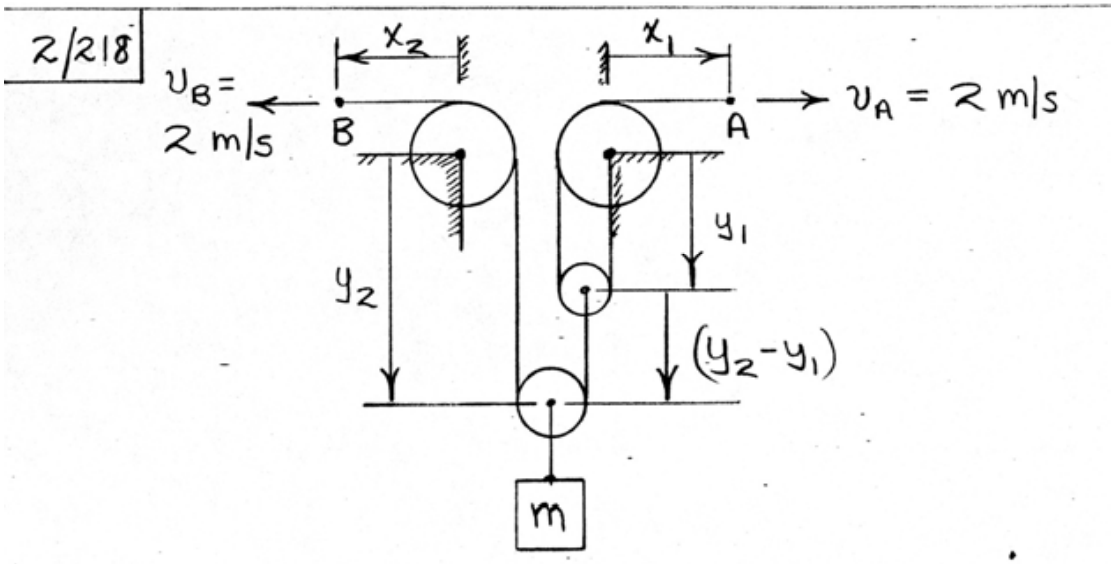

$x_1 + 2y_1 = \text{constant}; \quad \dot{x}_1 + 2\dot{y}_1 = 0, \quad \dot{y}_1 = -\frac{\dot{x}_1}{2}$

$x_2 + y_2 + (y_2 - y_1) = \text{constant}; \quad \dot{x}_2 + 2\dot{y}_2 - \dot{y}_1 = 0$

$\dot{x}_2 + 2\dot{y}_2 - \left(-\frac{\dot{x}_1}{2}\right) = 0$

$\dot{x}_2 + 2\dot{y}_2 + \frac{\dot{x}_1}{2} = 0, \quad \dot{y}_2 = -\frac{\dot{x}_2}{2} - \frac{\dot{x}_1}{4} = -\frac{2}{2} - \frac{2}{4} = -1.5 \text{ m/s}$

or 1.5 m/s up