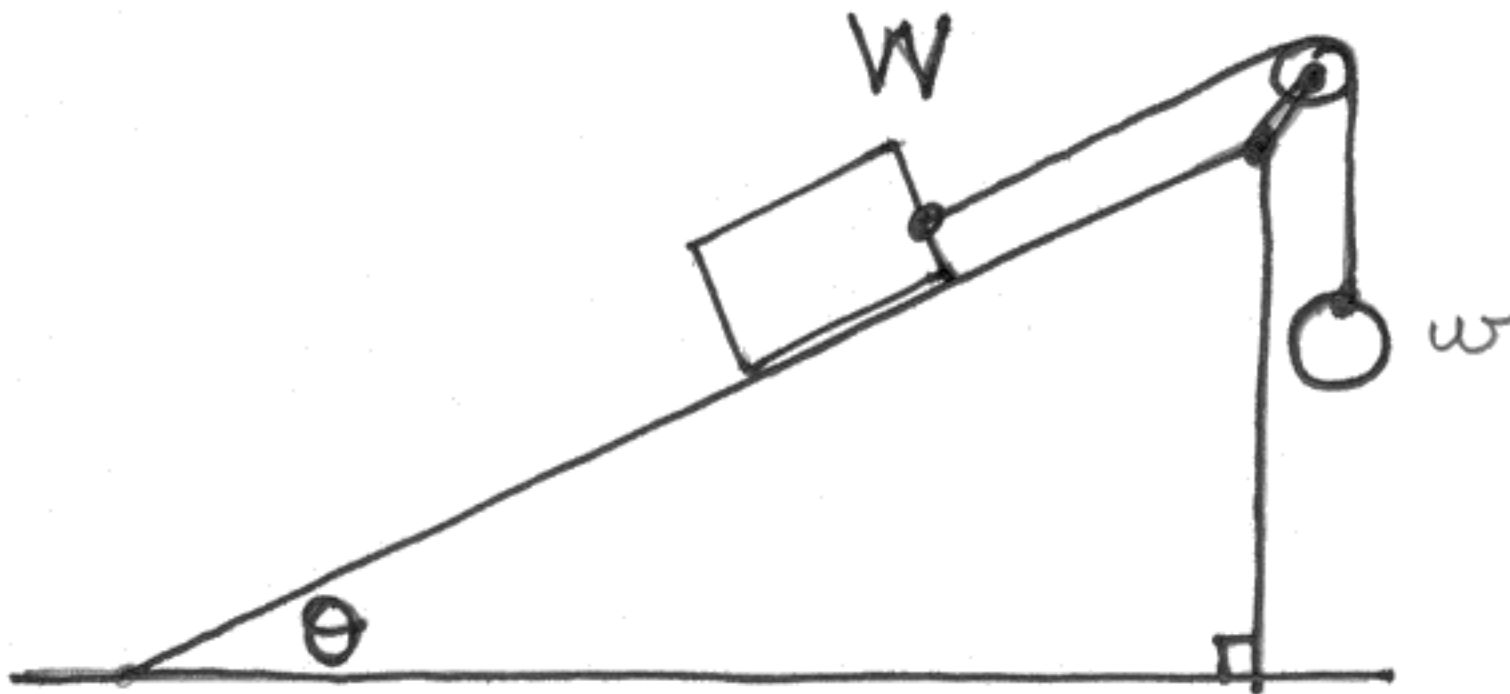


D:(10 points) Inclined Plane and Pulley

A large block with weight $W = 900N$ sits on a frictionless surface inclined at an angle $\theta = 30^\circ$ from the horizontal. A smaller weight $w = 500N$ is connected to the block by a string that goes up over a pulley. What is the tension T on the string? What is the acceleration a of the smaller weight? Is it up or down?

•(5pts) $T =$ _____

•(5pts) $a =$ _____

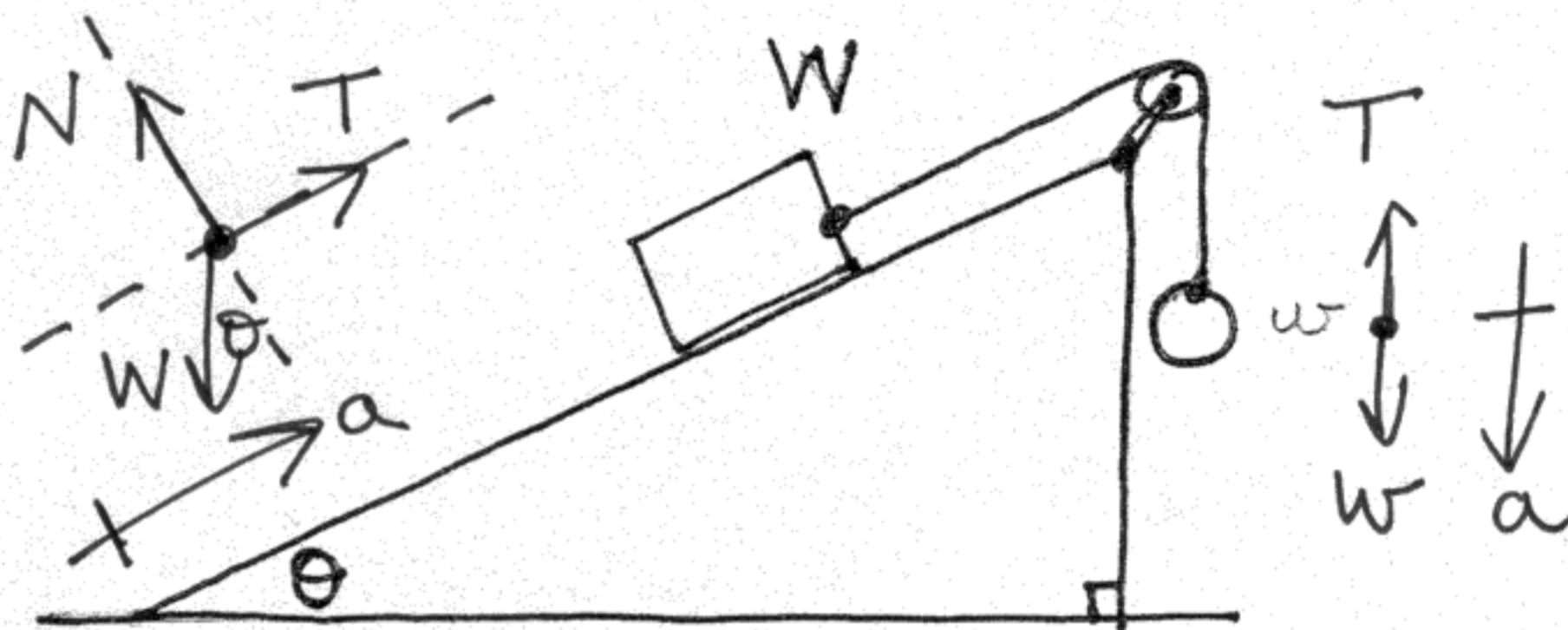


D:(10 points) Inclined Plane and Pulley

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•(5pts) $T = \underline{482\text{N}}$

•(5pts) $a = \underline{+0.35\text{ m/s}^2}$



$$\left. \begin{aligned} w - T &= ma = w \frac{a}{g} \\ T - W \sin \theta &= Ma = W \frac{a}{g} \end{aligned} \right\} \Rightarrow$$

$$T = w \left(1 - \frac{a}{g} \right)$$

$$w \left(1 - \frac{a}{g} \right) - W \sin \theta = W \frac{a}{g}$$

$$(w - W \sin \theta) = (W + w) \frac{a}{g}$$

$$a = g \cdot \left(\frac{w - W \sin \theta}{w + W} \right) = \boxed{+0.35 \text{ m/s}^2}$$

$$T = w \left(1 - \frac{a}{g} \right) = \boxed{482.143 \text{ N}}$$