----- Problem 1 -----  A 7 kg block is moving across a horizontal frictionless floor at $v_x = 2 \text{ m/s}$ when an applied force on the block is initiated and then held constant. This applied force is magnitude 25 N and it is directed at $34^\circ$ above the $+x$ axis.

After 3 m of sliding,

- what was the work done by the applied force?
- what was the work done by gravity?
- what was the work done by the normal force?
- what was the block’s final speed?

----- Problem 2 -----  A 0.48 kg cart rolls down a ramp inclined at $19^\circ$. A constant applied force directed up the ramp slows the cart down and brings it to rest over a distance of 0.46 m (along the ramp). At the instant the applied force is initiated, the cart has a speed of $2.2 \text{ m/s}$.

Over the duration of the catch,

- what was the net work done on the cart?
- what was the work done by gravity?
- what was the work done by the normal force?
- what was the magnitude of the applied force?

Answers
1. $W_{\text{Fapp}} = 62.178 \text{ J}$, $W_{\text{mg}} = 0$, $W_{\text{FN}} = 0$, $v_f = 4.665 \text{ m/s}$
2. $W_{\text{net}} = -1.1616 \text{ J}$, $W_{\text{mg}} = +0.7045 \text{ J}$, $W_{\text{FN}} = 0$, $F_{\text{app}} = 4.06 \text{ N}$