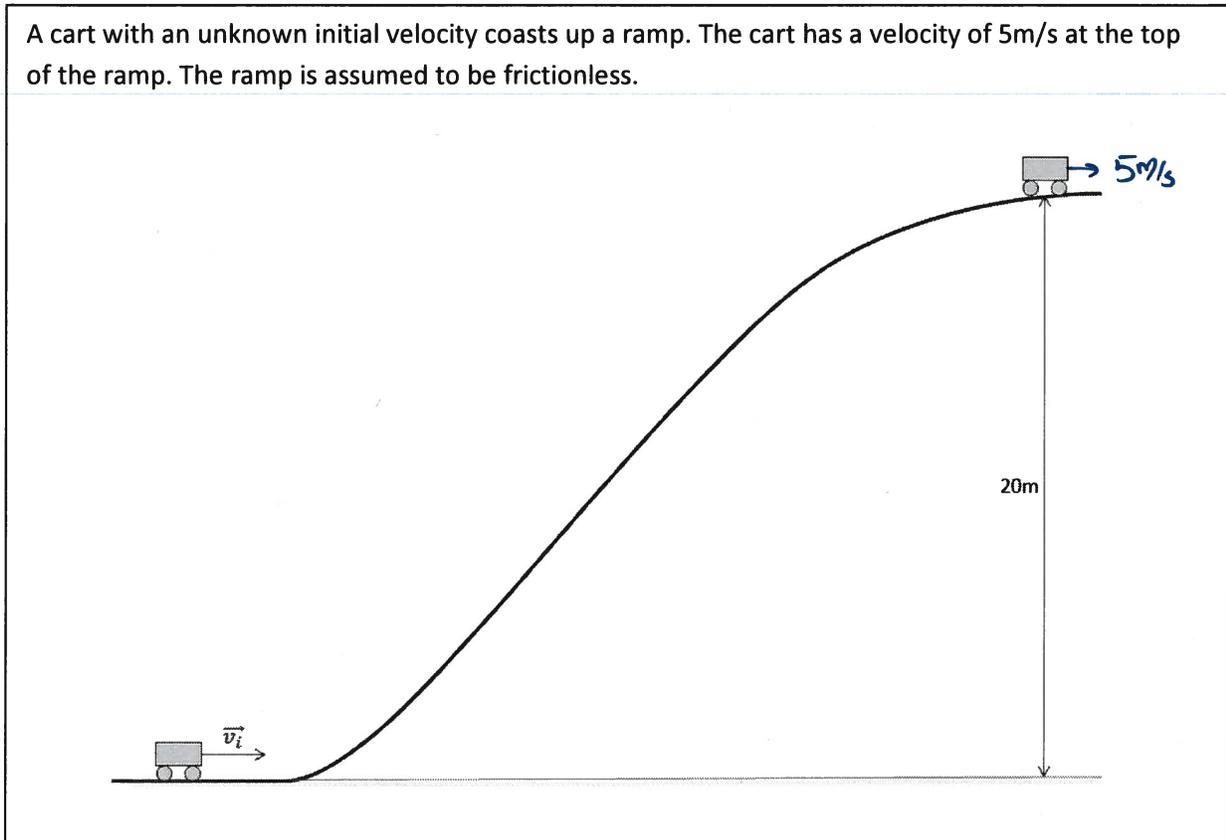


First Name: _____

Last Name: _____

LO5 - EQ - Conservation of Mechanical Energy

Use the following information to answer Q1:



Q1: How fast was the cart moving originally, in m/s?

(Record your **three-digit** answer in the Numerical Response boxes below)

2	0	.	4
---	---	---	---

$$E_i \rightarrow E_f$$

$$\frac{1}{2}mv_i^2 = \frac{1}{2}mv_f^2 + mgh_f$$

$$\frac{1}{2}v_i^2 = \frac{1}{2}(5)^2 + (9.81)(20)$$

$$\frac{1}{2}v_i^2 = 12.5 + 196.2$$

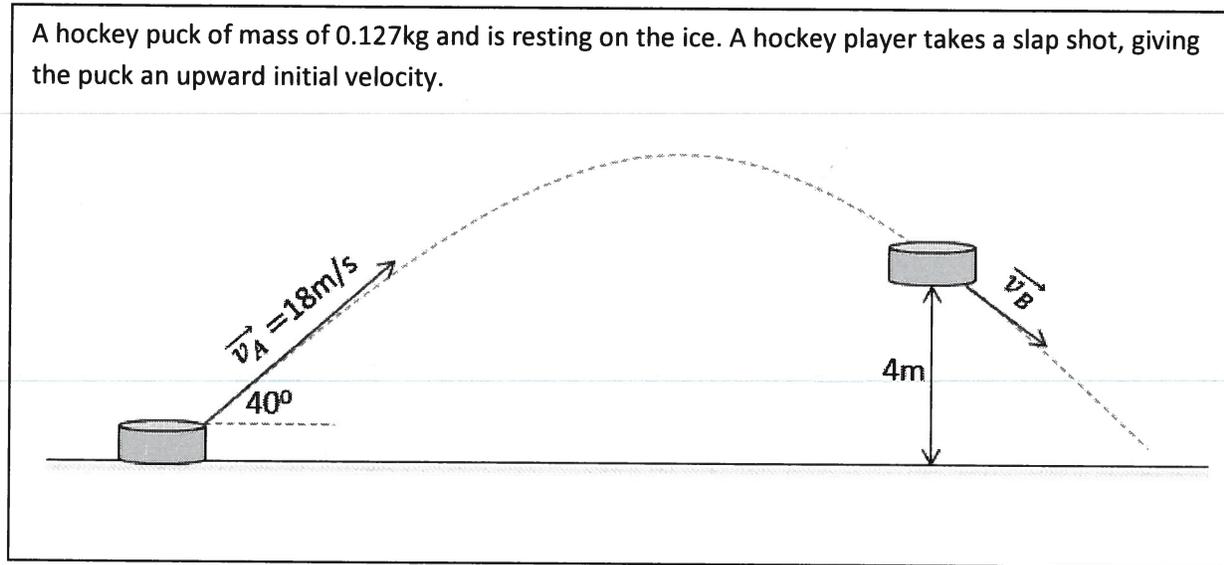
$$\frac{1}{2}v_i^2 = 208.7$$

$$v_i^2 = 417.4$$

$$v_i = 20.43 \text{ m/s}$$

$$v_i \approx 20.4 \text{ m/s}$$

Use the following information to answer Q2:



Q2: How fast is the puck moving at Position B, in m/s?

(Record your three-digit answer in the Numerical Response boxes below)

1	5	.	7
---	---	---	---

Option #1

$$E_i \rightarrow E_f$$

$$\frac{1}{2}mv_i^2 = \frac{1}{2}mv_f^2 + mgh_f$$

$$\frac{1}{2}(18)^2 = \frac{1}{2}v_f^2 + (9.81)(4)$$

$$162 = \frac{1}{2}v_f^2 + 39.24$$

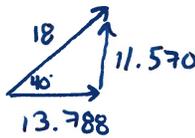
$$122.76 = \frac{1}{2}v_f^2$$

$$v_f^2 = 245.52$$

$$v_f = 15.669$$

$$v_f \approx 15.7 \text{ m/s}$$

Option #2



X-comp

$$v_x = 13.788$$

$$d_x = ?$$

$$t = ?$$

y-comp

$$v_{iy} = 11.570 \text{ m/s}$$

$$a = -9.81 \text{ m/s}^2$$

$$d = +4 \text{ m}$$

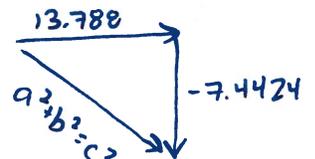
$$v_f = ?$$

$$v_f^2 = v_i^2 + 2ad$$

$$v_f^2 = (11.570)^2 + 2(-9.81)(4)$$

$$v_f^2 = 55.388995$$

$$v_f = -7.4424 \text{ m/s}$$



MARKING:

Beginning	0.0 – 0.5
Progressing	1.0
Competent	1.5
Exemplary	2.0

$$a^2 + b^2 = c^2$$

$$c = 15.669$$

$$v_f \approx 15.7 \text{ m/s}$$