Question:

A skier is gliding along at 3.9 m/s on horizontal, frictionless snow. He suddenly starts down a 10°
incline. His speed at the bottom is 10 m/s .
How long does it take him to reach the bottom?

Solution:

The initial skier's velocity along the incline is $v_1 = v \cos\alpha = 3.9 \cdot 0.98 = 3.8$ (m/s), the
acceleration in this direction equals to $a = g \cdot \sin\alpha = 9.81 \cdot 0.17 = 1.7$ (m/s²), therefore the time is

$$\tau = \frac{v_B - v_1}{a} = \frac{10 - 3.8}{1.7} = 3.6 \text{ (s)}.$$

The answer:

It takes $\tau = \dfrac{v_B - v_1}{a} = \dfrac{10 - 3.8}{1.7} = 3.6$ s.