

Chapter 16

Problem 44

She can hike 1.00 km in 10 minutes

Her ~~is~~ velocity is

$$v = \frac{x}{t} = \frac{1000\text{m}}{40(10)}$$
$$v = \frac{x}{t} = \frac{1\text{ km}}{10\text{ min}} \left(\frac{1000\text{ m}}{1\text{ km}} \right) \left(\frac{1\text{ min}}{60\text{ s}} \right) = 1.67 \frac{\text{m}}{\text{s}}$$

When she yells the
sound travels 2x

The distance to the cliff

the time for the echo to return is

2s; therefore the distance to the cliff
takes sound 1s to get there.

$$x_c = v_s \cdot t = (343\text{ m/s})(1\text{ s}) = 343\text{ m}$$

for her to reach the cliff

$$x_c = v \cdot t \rightarrow t = \frac{x_c}{v}$$

$$t = \frac{343\text{ m}}{1.67\text{ m/s}} = 205\text{ s}$$

$$\text{It takes her } t = 205\text{ s} \left(\frac{1\text{ min}}{60\text{ s}} \right) = \boxed{3.4\text{ min}}$$