

NEWTON'S SECOND LAW PROBLEMS  
brief answers

Full solutions to the problems are available in the Solutions document, and in the YouTube videos.

You can find links to these resources at my website:

[www.freelance-teacher.com](http://www.freelance-teacher.com)

Links to the documents are also in the video description boxes for the YouTube videos.

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Video (1)

- (a) The normal force has magnitude 16.4 N and direction “up”.
- (b) The acceleration has magnitude  $2.5 \text{ m/s}^2$  and direction “right”.

Video (2)

The normal force has magnitude 16.7 N and direction “up”.

Video (3)

- (a) The normal force has magnitude 72 N and direction “perpendicular to, and away from, the surface of the hill”.
- (b) The acceleration has magnitude  $5.6 \text{ m/s}^2$  and direction “parallel to, and down, the surface of the hill”.

Video (4)

- (a) The normal force has magnitude 25.5 N and direction “perpendicular to, and away from, the surface of the incline”.
- (b) The acceleration has magnitude  $6.8 \text{ m/s}^2$  and direction “parallel to, and up, the surface of the incline”.

Video (5)

The acceleration has magnitude  $0.59 \text{ m/s}^2$  and direction “parallel to, and down, the surface of the incline”.

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Video (6)

$$\mu_k = 0.41$$

Video (7)

$$\mu_k = 0.51$$

Video (8)

$$D = \frac{v_0^2}{2\mu_k g}$$

Video (9)

It takes the box 2.3 s to reach the bottom of the ramp.

Video (10)

$$\mu_k = 0.42$$

Video (11)

The block's speed when it reaches the top of the wall is 2.3 m/s.