

P3.2 Cliff Practice Problems

Round to three figures, Ignore air friction and use the convention that down is negative. $g = 9.80 \text{ m/s}^2$

<p>1.25 s 9.07 m/s -12.2 m/s 15.2 m/s, 53.4° blw hrz</p>	<p>1. A ball is projected with a purely horizontal velocity from an 7.60 m tall cliff and lands 11.3 m from the base of the cliff.</p> <p>a. What time is the ball in the air?</p> <p>b. With what purely horizontal velocity was it projected from the top of the cliff?</p> <p>c. What is the final vertical velocity? (Just before it hits the ground)</p> <p>d. Draw a picture of the final velocity of impact. Calculate the speed it is traveling, and find the angle below horizontal the velocity makes.</p>
<p>19.6 m 2.00 s -19.6 m/s 23.2 m/s, 57.5° blw hrz</p>	<p>2. A ball leaves the edge of a cliff with a purely horizontal velocity of 12.5 m/s, and lands 25.0 m from the base of the cliff</p> <p>a. How high is the cliff?</p> <p>b. What time does it take the ball to hit the ground?</p> <p>c. What is the final vertical velocity? (Just before it hits the ground)</p> <p>d. Draw a picture of the final velocity of impact. Calculate the speed it is traveling, and find the angle below horizontal the velocity makes.</p>
<p>9.88 m high 12.9 m -13.9 m/s 16.6 m/s, 56.8° blw hrz</p>	<p>3. A ball rolls off the edge of a cliff. The instant it leaves the edge, it has a purely horizontal velocity of 9.10 m/s, and it strikes the ground after 1.42 seconds.</p> <p>a. How high is the cliff?</p> <p>b. How far from the base of the cliff does the ball land?</p> <p>c. What is the final vertical velocity? (Just before it hits the ground)</p> <p>d. Draw a picture of the final velocity of impact. Calculate the speed it is traveling, and find the angle below horizontal the velocity makes.</p>
<p>1.41 s 19.0 m -13.8 m/s 19.3 m/s, 45.6° blw hrz</p>	<p>4. A ball is projected sideways at 13.5 m/s from the top of a 9.70 m tall cliff.</p> <p>a. What time is the ball in the air?</p> <p>b. How far from the base of the cliff does the ball land?</p> <p>c. What is the final vertical velocity? (Just before it hits the ground)</p> <p>d. Draw a picture of the final velocity of impact. Calculate the speed it is traveling, and find the angle below horizontal the velocity makes.</p>
<p>20.6 m high 10.5 m/s -20.1 m/s 22.7 m/s, 62.3° blw hrz</p>	<p>5. A ball rolls off the edge of a cliff with a purely horizontal velocity, and strikes the ground 2.05 s later at a distance of 21.6 m from the base of the cliff.</p> <p>a. How high is the cliff?</p> <p>b. What was the ball's horizontal velocity?</p> <p>c. What is the final vertical velocity? (Just before it hits the ground)</p> <p>d. Draw a picture of the final velocity of impact. Calculate the speed it is traveling, and find the angle below horizontal the velocity makes.</p>