

Name:

### Free Fall Problems Practice

Problem	Given	Equation(s)	Plug in and solve
<p><b>#1</b> A quarter is thrown off a bridge. After 1.2 seconds, the quarter is traveling at -21 m/s. What was the initial velocity of the quarter?</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p style="text-align: right;"><i>(Answer: -9.2 m/s)</i></p>
<p><b>#2</b> How long does it take a golf ball dropped from a skyscraper to fall 53.1 m?</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p style="text-align: right;"><i>(Answer: 3.29 s)</i></p>
<p><b>#3</b> You throw a ball straight upward at 5 m/s. The ball moves upward, comes to a momentary rest, and then falls downward. How long does it take for the ball to come to the momentary rest at the top of the throw? [Hint: What is the velocity (<math>v_f</math>) at the top of the throw?]</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p style="text-align: right;"><i>(Answer: 0.5 s)</i></p>

<p><b>#4</b> A bowling ball is thrown down from a bridge at -2.7 m/s. Calculate its velocity after 2.8 seconds.</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p>(Answer: -30 m/s)</p>
<p><b>#5</b> An alien on Planet X drops a rock off a cliff. When the rock has fallen for 4 seconds, it is travelling at -11.3 m/s. What is the value of g on Planet X?</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p>(Answer: 2.83 m/s<sup>2</sup>)</p>
<p><b>#6</b> How far has a rock fallen 8 seconds after it is thrown upward at 9.6 m/s?</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p>(Answer: -237 m)</p>
<p><b>#7</b> A tennis ball is thrown upward at 4 m/s. How long until the tennis ball is travelling at -4 m/s?</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p>(Answer: 0.8 s)</p>

<p><b>#8</b> How far has a rock fallen 6 seconds after being thrown downward at -3.9 m/s?</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p style="text-align: right;"><i>(Answer: -200 m)</i></p>
<p><b>#9</b> How long does it take a baseball thrown upward at 3.6 m/s to reach a velocity of -16 m/s?</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p style="text-align: right;"><i>(Answer: 2.0 s)</i></p>
<p><b>#10</b> You drop a tennis ball off the roof of a building. How far has the tennis ball fallen when it is moving at -7.2 m/s? [Hint: This is a two-step problem. First, find how long it takes to be traveling at -7.2 m/s. Then, find how far it fell in that time.]</p>	$v_i = \underline{\hspace{2cm}}$ $v_f = \underline{\hspace{2cm}}$ $t = \underline{\hspace{2cm}}$ $\Delta y = \underline{\hspace{2cm}}$		<p style="text-align: right;"><i>(Answer: -2.6 m)</i></p>