

Question Number	Answer	Mark
2(a)	<p><b>Any PAIR from:</b> (1)</p> <p><math>\ln V = \ln V_0 - bt</math> (1)</p> <p>Is in the form <math>y = c + mx</math> <b>and</b> the <u>gradient</u> is <math>-b</math> which is constant</p> <p><b>Or</b></p> <p><math>\ln V = -bt + \ln V_0</math></p> <p>Is in the form <math>y = mx + c</math> <b>and</b> the <u>gradient</u> is <math>-b</math> which is constant</p> <p>MP2 dependent on MP1, allow reference to straight line</p>	2
2(b)	<p>Open the tap and start recording time (simultaneously) (1)</p> <p>Record volumes at successive time intervals</p> <p><b>Or</b></p> <p>Record the time taken to fall to specific volumes (1)</p> <p>Read to the bottom of the meniscus (1)</p> <p>Any <b>ONE</b> from:</p> <p>Ensure transparent tube is vertical (1)</p> <p>Use a stopwatch <b>Or</b> lap timer to measure <math>t</math> (1)</p> <p>Keep stopwatch close to the tube (1)</p> <p>Refill to same initial volume <b>and</b> repeat to take a mean (1)</p> <p>Record many measurements of <math>V</math> and <math>t</math> (1)</p> <p>Open the tap to same position each time (1)</p>	4
2(c)	<p><b>Any PAIR from</b></p> <p>It may be difficult to measure <math>V</math> and <math>t</math> simultaneously (1)</p> <p>which will affect <u>random</u> error (1)</p> <p><b>Or</b></p> <p>There is liquid below the scale (1)</p> <p>which will introduce <u>systematic</u> error (1)</p> <p><b>Or</b></p> <p>Air may be trapped in the tap (1)</p> <p>which will affect <u>random</u> error (1)</p> <p>MP2 dependent on MP1</p>	2
<b>Total for question 2</b>		<b>8</b>