

Question	Scheme	Marks	AOs
3(a)	Uses or implies that $V = at + b$	B1	3.3
	Uses both $4 = 24a + b$ and $2.8 = 60a + b$ to get either a or b	M1	3.1b
	Uses both $4 = 24a + b$ and $2.8 = 60a + b$ to get both a and b	M1	1.1b
	$\Rightarrow V = -\frac{1}{30}t + 4.8$	A1	1.1b
		(4)	
(b)	(i) States that the initial volume is 4.8 m^3	B1 ft	3.4
	(ii) Attempts to solve $0 = -\frac{1}{30}t + 4.8$	M1	3.4
	States 144 minutes	A1	1.1b
		(3)	
(c)	States any logical reason <ul style="list-style-type: none"> The tank will leak more quickly at the start due to the greater water pressure The hole will probably get larger and so will start to leak more quickly Sediment could cause the leak to be plugged and so the tank would not empty. 	B1	3.5b
		(1)	

(8 marks)

Notes:
<p>(a)</p> <p>B1: Uses or implies that $V = at + b$</p> <p>You may award this at their final line but it must be $V = f(t)$</p> <p>M1: Awarded for translating the problem in context and starting to solve. It is scored when both $4 = 24a + b$ and $2.8 = 60a + b$ are written down and the candidate proceeds to find either a or b. You may just see a line $\pm \frac{4 - 2.8}{60 - 24}$</p> <p>M1: Uses $4 = 24a + b$ and $2.8 = 60a + b$ to find both a and b</p> <p>A1: $V = -\frac{1}{30}t + 4.8$ or exact equivalent. Eg $30V + t = 144$</p>
<p>(b)(i)</p> <p>B1ft: Follow through on their ‘b’</p> <p>(b)(ii)</p> <p>M1: States that $V = 0$ and finds t by attempting to solve their $0 = -\frac{1}{30}t + 4.8$</p> <p>A1: States 144 minutes</p>
<p>(c)</p> <p>B1: States any logical reason. There must be a statement and a reason that matches See scheme</p>