Daily Question Applied Maths Day 6 Mark Scheme

	NB: For the whole of this question, confusion between horizontal and vertical is **not a misread**		
a	$x = 3$	B1	Seen or implied anywhere Do not accept x =3**i**
	Use of $v^2 = u^2 + 2as$	M1	Complete method using *suvat* or energy to form an equation in y. Condone sign errors
	$15^2 = y^2 + 2 \times g \times 10$	A1	Correct unsimplified equation
	$y^2 = 29,\ y = 5.4$ or 5.39	A1	2 sf or 3 sf . If final answer is y = 5.4**j** do not penalise inclusion of a vector a second time.
			SC allow 4/4 for x**i** + y**j** =3**i** + 5.4**j**
		[4]	
a alt	$x = 3$	B1	Seen or implied anywhere Do not accept x =3**i**
	Equation for conservation of energy	M1	Require all 3 terms and no extras. Dimensionally correct. Condone sign errors. Must include m
	$\frac{1}{2}m \times \left(3^2 + 15^2\right) = mg \times 10 + \frac{1}{2}m\left(x^2 + y^2\right)$	A1	Correct unsimplified equation – any equivalent form
	$y^2 = 29,\ y = 5.4$ or 5.39	A1	2 sf or 3 sf . If final answer is y = 5.4**j** do not penalise inclusion of a vector a second time.
		[4]	

b	Time from B to C:	M1	Complete method using *suvat* and their vertical speed. Condone sign errors
	$-15 = 5.39 - gt \quad (t = 2.08)$	A1ft	Correct equation in t only e.g. $10 = 15t - \frac{1}{2}gt^2$ ft on their 5.39 if used
	Horizontal distance $= 3t\ (= their\ x \times their\ t)$	DM1	Complete method using *suvat* and their x value. Dependent on preceding M1
	$(AC =)$ 6.2(m) or 6.24(m)	A1	2 sf or 3 sf NB Penalise over-accuracy only once per question
		[4]	
		(8)	