Question Number	Scheme	Notes	Marks
4(a)(i)	(–7, 9) or e.g. $x = -7, y = 9$	$x = -7$ **or** $y = 9$	B1
		$x = -7$ **and** $y = 9$	B1
	Award the marks in (a) once correct answers are seen. **Special case:** If all you see is (9, –7) award B1B0		
(a)(ii)	Examples: $r = \sqrt{\left(-3-\left("-7"\right)\right)^2+\left(12-"9"\right)^2}$ **or** $r = \sqrt{\left(-11-\left("-7"\right)\right)^2+\left(6-"9"\right)^2}$ **or** $r = \frac{1}{2}\sqrt{\left(-3+11\right)^2+\left(12-6\right)^2}$	Correct strategy for the radius. Must be a correct method for their centre (if used) **but allow 1 sign slip within one of the brackets**. A correct answer scores both marks. Must see the ½ if finding the length of the diameter.	M1
	$r = 5$	Correct radius	A1
			(4)
(b)	$\left(x+7\right)^2+\left(y-9\right)^2=5^2$ or e.g. $x^2+y^2+2\times7x-2\times9y+7^2+9^2-5^2=0$ M1: Correct attempt at circle equation using their values. Allow for $\left(x\pm\left(their-7\right)\right)^2+\left(y\pm\left(their\,9\right)\right)^2=\left(their\,numerical\,r\right)^2$ or e.g. $x^2+y^2\pm2\times\left(their-7\right)x\pm2\times\left(their\,9\right)y+\left(their-7\right)^2+\left(their\,9\right)^2-\left(their\,numerical\,r\right)^2=0$ A1: Correct equation in any form		M1A1
			(2)
(c)	$m_{radius}=\frac{12-9}{-3+7}\left(=\frac{3}{4}\right)$ **or** $m_{tangent}=-1\div\left(\frac{12-9}{-3+7}\right)\left(=-\frac{4}{3}\right)$ **or** $m_{tangent}=-\left(\frac{-3+7}{12-9}\right)\left(=-\frac{4}{3}\right)$	This mark is for an attempt to find the radius gradient **or** the tangent gradient. If the method is not clear allow one sign error in the numerator or denominator.	M1
	Alternative for the first M: $\left(x+7\right)^2+\left(y-9\right)^2=5^2\Rightarrow2\left(x+7\right)+2\left(y-9\right)\frac{dy}{dx}=0$ $\frac{dy}{dx}=\frac{x+7}{9-y}=\frac{-3+7}{9-12}\left(=-\frac{4}{3}\right)$ Allow for $\left(x+7\right)^2+\left(y-9\right)^2=5^2\Rightarrow\alpha\left(x+7\right)+\beta\left(y-9\right)\frac{dy}{dx}=0\Rightarrow\frac{dy}{dx}=...$		
	$y-12=-\frac{4}{3}\left(x+3\right)$ Uses a correct straight line method for the **tangent** using the point Q. Must be fully correct work here so must be a clear attempt at the tangent not the radius. So if the radius gradient is found previously, must apply negative reciprocal rule to their radius gradient. If using $y = mx + c$ must reach as far as $c = \ldots$		M1
	$4x+3y-24=0$	Allow any integer multiple	A1
			(3)
			Total 9

Question Number	Scheme	Notes	Marks
5(a)	$t_{40} = 100 + (40-1)\times 5$	Uses $a + (n-1)d$ with $a = 100$, $d = 5$ and $n = 40$. This may be implied by a correct expression e.g. $100 + 39\times 5$	M1
	= (£)295	Cao. Correct answer with no working scores both marks.	A1
			(2)
(b)	$S_{60} = \frac{1}{2}(60)(2\times 100 + (60-1)\times 5)$ or $l = 100 + (60-1)\times 5 = 395$ $S_{60} = \frac{1}{2}(60)(100+395)$	Uses a correct sum formula with $a = 100$, $d = 5$ and $n = 60$ **or $n = 40$**. May be implied by a correct numerical expression. If using $\frac{1}{2}n(a+l)$ with $n = 40$ you may see $\frac{1}{2}(40)(100+295)$ using their result from (a) and this scores M1 also.	M1
		Correct numerical expression **with $n = 60$**. If there are any missing brackets then this mark should be withheld unless the correct expression is implied by their answer.	A1
	= (£)14 850	Cao. Correct answer with no working scores 3 marks. Apply isw if necessary and award this mark once a correct answer is seen.	A1
			(3)
(c)	$\frac{1}{2}n(2\times 600 + (n-1)\times -10) = 18200$	Attempts to use a correct sum formula with $a = 600$, $d = -10$ and sets = 18 200. Condone poor use of brackets.	M1
		Correct equation which may be implied by subsequent work.	A1
	$600n - 5n^2 + 5n = 18200$ $5n^2 - 605n + 18200 = 0$ $n^2 - 121n + 3640 = 0$ *	Obtains the printed answer with at least one intermediate line and no errors. Allow other variables to be used for n but the final answer must be as printed including "= 0"	A1*
			(3)
(d)	$(n-56)(n-65) = 0$ $\Rightarrow (n =) 56, 65$	Attempts to solve the given quadratic. This may be implied by correct answers. Apply general guidance if necessary but must reach at least one value for n. (Allow them to use x rather than n)	M1
		Correct values (ignore how they are labelled e.g. allow $x = \ldots$)	A1
			(2)
(e)	E.g. ($n =$) 65 because e.g. the money has already been saved after 56 months	States ($n =$) 65 and gives a suitable reason – see below for examples of acceptable comments. There must be no contradictory statements and any calculations must be correct.	B1
			(1)
			Total 11

Acceptable comments for 5(e):

$n = 65$ means $t = 600 - 10\times 64 = -40$ which is not possible/doesn't make sense/etc.

$n = 65$ because Lina will have saved the money after 56 months

$n = 65$ because Lina will have saved the money before then

$600 + (n-1)\times -10 = 0 \Rightarrow n = 61$ so she will have paid off the loan before $n = 65$

Condone "because 65 > 60" or equivalent e.g. it is only over 60 months (or 5 years)

$n = 65$ means $t = 600 - 10\times 64 = -40$ so reject (but not just "it is negative")