Quadratics Homework - Marking Scheme

Question	Main points of expected responses		
1	Discriminant	[1]	$b^2 - 4ac$ $64 + 36 = 100$
	Statement	[2]	Two real and distinct roots
2	Equate	[1]	$6 + 2x = 5 - x^2$
	Factorise	[2]	$x^2 + 2x + 1 = 0$ $(x+1)(x+1) = 0$ or $b^2 - 4ac = 0$
	Statement	[3]	Equal roots so tangent $x = -1$
	Point of contact	[4]	$(-1 , 4)$
3	Coefficients	[1]	$a = (p+1)$ $b = 2p$ $c = (p-2)$
	Discriminant	[2]	$b^2 - 4ac = 0$ $4p^2 - 4(p^2 - p - 2) = 0$
	Solve for p	[3]	$4p = -8$ $p = -2$
4	Completing the square	[1,2]	$(x+1)^2 + 6$
	Minimum value	[3]	$Mini\ value\ 6\ when\ x = -1$
	Maximum value	[4,5]	$Max\ value\ \dfrac{1}{6}$ when x $= -1$
5	Recurrence Relation	[1,2]	$U_{n+1} = 0.35u_n + 1400$
	Gradient at $x = -1$	[3,4,5]	$L = 0.35L + 1400$ $L = \dfrac{1400}{0.65} = 2154$kgs
	Statement		In the long term minimum weight of litter 2154kgs

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6	Correct Format	$\bullet^1$	$\dfrac{x^3}{x^{\frac{1}{2}}} - \dfrac{4x}{x^{\frac{1}{2}}}$
			$x^{\frac{5}{2}} - 4x^{\frac{1}{2}}$
	Differentiate	$\bullet^2$	$\dfrac{5}{2}x^{\frac{3}{2}} - 2x^{-\frac{1}{2}}$
			$\dfrac{5}{2}\sqrt{x^3} - \dfrac{2}{\sqrt{x}}$

Total 21 marks