

**Assessment Schedule – 2014**

**Mathematics and Statistics: Apply algebraic methods in solving problems (91261)**

**Evidence Statement**

One	Expected Coverage	Achievement (u)	Merit (r)	Excellence (t)
(a)(i)	$\frac{a^{12}}{125}$	Correct.		
(ii)	$0.5x^{1.5}$ or $0.5x^{\frac{3}{2}}$	Correct equivalent.		
(iii)	$\frac{2x^2}{3x^{-8}} = \frac{2}{3}(x^{10})$	Numerator or denominator correct.	Correct expression.	
(b)	Let the roots be $n$ and $3n$ . $3n^2 = 12$ $n^2 = 4$ $n = \pm 2$ $4n = \pm m$ $m = \pm 8$	Relationship shown.	Values of $n$ found.	Values of $m$ found.
(c)	$3x^2 - nx + 5 = 0$ For 2 solutions $n^2 - 4 \times 3 \times 5 > 0$ $n^2 > 60$ $n > 7.7$ or $n < -7.7$	Discriminant given.	One value of $n$ found.	Both parts of inequality given.
(d)	$(5x^2 - 4)(2x^2 - 1)$ $x^2 = 0.8$ or $0.5$ $x = \pm 0.894$ or $\pm 0.707$	Expression factorised.	Solved for $x^2$ .	All solutions given.

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response; no relevant evidence.	Attempt at one question	1 of u	2 of u	3 of u	1 of r	2 of r	1 of t	2 of t

Two	Expected Coverage	Achievement (u)	Merit (r)	Excellence (t)
(a)(i)	$(3a - 5)(4a + 3)$ $a = \frac{5}{3}$ or $-\frac{3}{4}$	Correct factorising or solution.	Correct solution showing factorisation.	
(b)(i)	$\frac{3x+3-4x^2+8x}{(x-2)(x+1)}$ $= \frac{-4x^2+11x+3}{x^2-x-2}$	Correct single fraction	Correctly simplified.  Accept with denominator in factorised form.	
(ii)	$\frac{(x+4)(x-2)}{(x+1)(x-2)} = 3$ $x+4 = 3x+3$ if $x \neq 2$ $2x = 1$ $x = 0.5$	Factorised and simplified  CAO.	Solved for $x$ .	Condition $x \neq 2$ .
(c)(i)	$rx^2 - tx - h = 0$ $x = \frac{t \pm \sqrt{t^2 + 4rh}}{2r}$		Answer with $\pm$ before surd.	
(ii)	$h = ax(x-12)$ when $x = 6, h = 6$ $6 = 6a \times -6$ $a = -\frac{1}{6}$ $h = -\frac{1}{6}x(x-12)$ Or $y = -\frac{1}{6}x^2 + 2x$	General form of equation and recognition of point (6,6).	Correct equation.	
(iii)	$h = -\frac{1}{6}x(x-12) = 1.9$ $-x^2 + 12x - 6 \times 1.9 = 0$ $x = 1.04, 10.96$ width of lane 4.955 m		Solved for height of 1.9 m.	Correct width of lane found.

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response; no relevant evidence.	Attempt at one question	1 of u	2 of u	3 of u	1 of r	2 of r	1 of t	2 of t

Three	Expected Coverage	Achievement (u)	Merit (r)	Excellence (t)
(a)(i)	$3^x = 81$ $x = 4$	Correctly solved.		
(ii)	$343 = x^3$ $x = 7$	Correctly solved.		
(b)	$\left(\frac{5}{4}\right)^x = 15$ $x \log 1.25 = \log 15$ $x = \frac{\log 15}{\log 1.25}$ $x = 12.14$	Expression simplified.	Written in log form.	$x$ found.
(c)(i)	0.8 is the fraction of medication remaining after an hour.	Correct explanation.		
(ii)	$M = 224 \times 0.8^{t-0.5}$ $= 224 \times 0.8^{-0.5}$ $= 250.4 \text{ mg}$	Statement with $t = 0$ and attempt to solve.	Correctly solved.	
(iii)	$49.6 = 250.4 \times 0.8^t$ $0.8^t = \frac{49.6}{250.4}$ $t \log 0.8 = \log \frac{49.6}{250.4}$ $t = 7.25 \text{ hours}$	$M = 49.6$ recognised and attempt to solve.	Correctly used logs in attempt to solve	Correctly solved.

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response; no relevant evidence.	Attempt at one question	1 of u	2 of u	3 of u	1 of r	2 of r	1 of t	2 of t

**Cut Scores**

	Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
<b>Score range</b>	0 – 8	9 – 14	15 – 18	19 – 24