Assessment Schedule – 2007

Mathematics: Manipulate algebraic expressions and solve equations (90284)

Evidence Statement

	Achievement Criteria	No.	Evidence	Code	Judgement	Sufficiency
ACHIEVEMENT	Manipulate algebraic expressions and solve equations.	1	$(4x-3)(x+2)$	A	Any order. $4(x-\frac{3}{4})(x+2)$	**ACHIEVEMENT:** FOUR A
		2	$\log\frac{a}{b}$	A	$\log ab^{-1}$	
		3	$\frac{2x^2+3x+6}{x(x+2)}$	A	Or equivalent, including $\frac{3(x+2)+2x^2}{x(x+2)}$.	
		4(a)	$x=\frac{11}{3}$	A	Or equivalent. Incorrect rounding without working not accepted.	
		4(b)	$x=5$	A	Or equivalent.	
		5	$3t+55=4t+51$ $t=4$ min	A	Accept without unit. Must show equation.	
ACHIEVEMENT WITH MERIT	Solve problems involving equations.	6	$\ln(\frac{12}{1.5})=t\ln 1.08$ $t=\frac{\ln 8}{\ln 1.08}$ $=27.02$ *years*	(A)M	Or equivalent. Accept any correct rounding. *(If trial and error used, must show an answer for t >27.)*	**ACHIEVEMENT WITH MERIT:** Achievement **plus** TWO M OR THREE M
		7	$(x+2.75)(x+5.5)=3x^2$ $2x^2-8.25x-15.125=0$ $x=5.5,\ -1.375$ $x=5.5$	(A) M	Not necessary to show both solutions.	
		8	$5x+14=(x+4)^2$ $x^2+3x+2=0$ $(x+2)(x+1)=0$ $(-1,9)$ *and* $(-2,4)$	(A)M	Single coordinates insufficient. x values only (A)	

ACHIEVEMENT WITH EXCELLENCE	Choose algebraic techniques and strategies to solve problem(s).	9	$(x-k)(x-k+1)=0$ $x^2-kx+x-kx+k^2-k=0$ $x^2+(1-2k)x+(k^2-k)=0$ *equating coefficients*: $1-2k=6$ $2k=-5$ $k=-\frac{5}{2}$ $\therefore (x+\frac{5}{2})(x+\frac{7}{2})=0$ $c=\frac{35}{4}$ or, using quadratic formula $x=\frac{-6\pm\sqrt{36-4c}}{2}$ $=-3\pm\frac{1}{2}\sqrt{36-4c}$ *as roots differ by one*, $\sqrt{36-4c}=1$ $36-4c=1$ $4c=35$ $c=\frac{35}{4}$ or, using sum and product of roots: $k+(k-1)=-6 \quad (1)$ $k(k-1)=c \quad (2)$ $2k-1=-6$ $2k=-5$ $k=-\frac{5}{2}$ $\therefore c=k^2-k$ $=\frac{25}{4}+\frac{5}{2}$ $=\frac{35}{4}$	(A) (M) E A E E	Ignore ONE minor error or incorrect mathematical statement where it has led to correct (or consistent) solution.	**ACHIEVEMENT WITH EXCELLENCE:** Merit **plus** E

Judgement Statement — 2007

Achievement	Achievement with Merit	Achievement with Excellence
Manipulate algebraic expressions Solve equations. $4 \times$ A	Solve problems involving equations. **Achievement** *plus* $2 \times$ M *or* $3 \times$ M	Choose algebraic techniques and strategies to solve problem(s). **Merit** *plus* $1 \times$ E

The following Mathematics-specific marking conventions may also have been used when marking this paper:

- Errors are circled.
- Omissions are indicated by a caret (^).
- **NS** may have been used when there was not sufficient evidence to award a grade.
- **CON** may have been used to indicate 'consistency' where an answer is obtained using a prior, but incorrect answer and **NC** if the answer is not consistent with wrong working.
- **CAO** is used when the 'correct answer only' is given and the assessment schedule indicates that more evidence was required.
- **#** may have been used when a correct answer is obtained but then further (unnecessary) working results in an incorrect final answer being offered.
- **RAWW** indicates right answer, wrong working.
- **R** for 'rounding error' and **PR** for 'premature rounding' resulting in a significant round-off error in the answer (if the question required evidence for rounding).
- **U** for incorrect or omitted units (if the question required evidence for units).
- **MEI** may have been used to indicate where a minor error has been made and ignored.