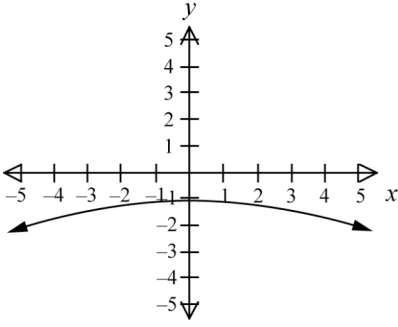


Assessment Schedule – 2007**Calculus: Manipulate real and complex numbers, and solve equations (90638)****Evidence and Judgement Statements**

	Achievement Criteria	No.	Evidence	Code	Judgement	Sufficiency
ACHIEVEMENT	Manipulate real and complex numbers and solve equations	1(a)	$-5 - 3i$	A1	No alternative	ACHIEVEMENT FOUR of Code A including at least ONE of Code A1 AND ONE of Code A2
		1(b)	$-\frac{1}{2} + \frac{7}{2}i$	A1	Or equivalent	
		2	$12 \operatorname{cis} \frac{19\pi}{28}$	A1	Or equivalent	
		3	$19 + 4\sqrt{2}$	A1	No alternative	
		4(a)	$x = (2 \pm \sqrt{3})a$	A2	Or equivalent	
		4(b)	$x = -145$	A2	No alternative	
ACHIEVEMENT WITH MERIT	Solve more complicated equations	5	$(2\sqrt{x+1})^2 = p\sqrt{x}$ $4x + 4 = p^2x$ $x = \frac{4}{p^2 - 4}, p \neq \pm 2$	A2 M	Accept $x = \frac{4}{p^2 - 4}$	MERIT: Achievement PLUS TWO of Code M OR THREE of Code M
		6	$(3x - 1)\ln 2 = (x - q)\ln 7$ $x = \frac{\ln 2 - q \ln 7}{3\ln 2 - \ln 7}$		A2 M	
		7	$r^4 \operatorname{cis} 4\theta = 16 \operatorname{cis} \frac{2\pi}{5}$ $\sqrt[4]{16 \operatorname{cis} \frac{2\pi}{5}} = \sqrt[4]{16} \operatorname{cis} \left(\frac{\pi}{10} + \frac{k\pi}{2} \right)$ 4 solutions are: $2 \operatorname{cis} \frac{\pi}{10}, 2 \operatorname{cis} \frac{3\pi}{5}, 2 \operatorname{cis} \left(-\frac{2\pi}{5} \right), 2 \operatorname{cis} \left(-\frac{9\pi}{10} \right)$	A2 M	Or equivalent	

	Achievement Criteria	Q.	Evidence	Code	Judgement	Sufficiency
ACHIEVEMENT WITH EXCELLENCE	Solve problem(s) involving real or complex numbers	8	$ z - 3i - z + 3i = 2$ $ x + i(y - 3) - x + i(y + 3) = 2$ $\sqrt{x^2 + (y - 3)^2} - \sqrt{x^2 + (y + 3)^2} = 2$ $(3y + 1)^2 = x^2 + y^2 + 6y + 9$ $x^2 - 8y^2 + 8 = 0$ <p>Bottom branch only:</p> $y = -\sqrt{\frac{x^2}{8}} + 1$ 	A1 or A2 M E	Or equivalent. Accept an answer that indicates both branches of the hyperbola	EXCELLENCE: Merit plus Code E

Judgement Statement — 2007

Achievement	Achievement with Merit	Achievement with Excellence
Manipulate real and complex numbers, and solve equations. 4 × A including at least 1 × A1 and 1 × A2	Solve more complicated equations. Achievement plus 2 × M <i>or</i> 3 × M	Solve problem(s) involving real or complex numbers. Merit plus 1 × 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 be 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.