

**Basic Complex Number Operations Exam Questions MS (From OCR 4725)**

**Q1, (Jun 2005, Q3)**

(i) $22 - 2i$	B1B1	2	Correct real and imaginary parts
(ii) $z^* = 2 - 3i$ $5 - 14i$	B1 B1B1	3	Correct conjugate seen or implied Correct real and imaginary parts
(iii) $\frac{4}{17} + \frac{1}{17}i$	M1 A1	2	Attempt to use $w^*$ Obtain correct answer in any form
		<b>7</b>	

**Q2, (Jun 2006, Q5)**

(i) $-7i$	B1 B1	2	Real part correct Imaginary part correct
(ii) $2 + 3i$ $-5 + 12i$	B1 B1 B1	3	$iz$ stated or implied or $i^2 = -1$ seen Real part correct Imaginary part correct
(iii) $\frac{1}{5}(4 - 7i)$ or equivalent	M1 A1 A1	3 <b>8</b>	Multiply by conjugate Real part correct Imaginary part correct <b>N.B. Working must be shown</b>

**Q3, (Jan 2009, Q1)**

$\frac{7}{26} + \frac{17}{26}i$	M1 A1 A1 A1	4 <b>4</b>	Multiply by conjugate of denominator Obtain correct numerator Obtain correct denominator
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**Q4, (Jan 2011, Q2)**

(i) $-12 + 13i$	B1B1	2	Real and imaginary parts correct
(ii)	B1 M1		$z^*$ seen Multiply by $w^*$
$\frac{27}{37} - \frac{14}{37}i$	A1		Obtain correct real part or numerator
	A1	<b>4</b>	Obtain correct imaginary part or denom. Sufficient working must be shown
		<b>6</b>	

**Q5, (Jun 2011, Q9)**

(i) $16 + 30i$	B1	1	State correct value
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(ii)	M1		Use $a = -$ ( sum of roots )
$a = -32$	A1		Obtain correct answer
	M1		Use $b =$ product of roots
$b = 1156$	A1	4	Obtain correct answer
	M1		Substitute, expand and equate imag. parts
	A1		Obtain $a = -32$
	M1		Equate real parts
	A1		Obtain $b = 1156$
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(iii)	M1		Attempt to equate real and imaginary parts of $(p+iq)^2$ & $16 - 30i$ or root from (ii)
$p^2 - q^2 = 16$ and $pq = -15$	A1		Obtain both results cao
	M1		Obtain quadratic in $p^2$ or $q^2$
	M1		Solve to obtain $p = (\pm)5$ or $q = (\pm)3$
	A1		Obtain 2 correct answers as complex nos
	M1		Attempt at all 4 roots
$\pm (5 \pm 3i)$	A1	7	State other two roots as complex nos
	<b>12</b>		

**Q6, (Jun 2013, Q1)**

$\sqrt{3}$	M1	Use correct trig expression
	A1	Obtain correct answer
$2\sqrt{3}$	M1	Correct expression for modulus
$3 - \sqrt{3}i$	A1FT	Obtain correct answer aef
$-\sqrt{3}i$	B1FT	Correct conjugate seen or implied
	B1FT	Correct answer
	<b>[6]</b>	

**Q7, (Jun 2015, Q1)**

$z^* = x - iy$	B1	Conjugate stated or used
$ z  = \sqrt{x^2 + y^2}$	B1	Modulus or it's square stated or used
$2(x^2 + y^2)$	B1	Obtain correct answer, a.e.f. but not involving i
	<b>[3]</b>	