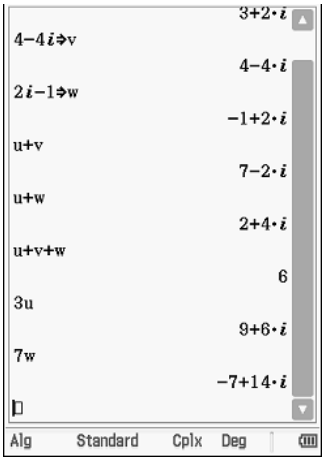
Activity 38 Operating with complex numbers

1. a)

number	Real part	Imaginary part
u	3	2
v	4	–4
w	–1	2



b)

(i) $7 - 2i$

(ii) $2 + 4i$

(iii) 6

(iv) It is the same as adding like terms

c)

(i) $9 + 6i$

(ii) $-7 + 14i$

(iii) Use rules for multiplying brackets, the real number times the complex number in brackets.

2. a)

(i) $4I - 4I^2$

(ii) $4 - 4i$

(iii) $i^2 = -1$ and then collect like terms.

b)

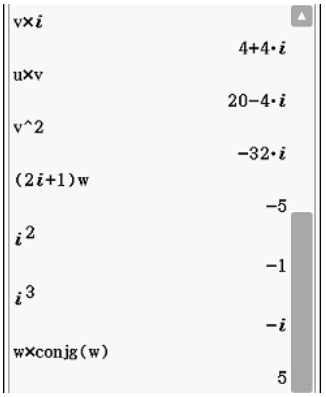
(i) $12 - 4I - 8I^2$

(ii) $20 - 4i$

(iii) $i^2 = -1$ and then collect like terms.

3.

Expression	Number	Conjugate
u	$3+2i$	$3-2i$
vi	$4+4i$	$4-4i$
uv	$20-4i$	$20+4i$
v^2	$-32i$	$32i$
$(2i+1)w$	-5	-5
i^2	-1	-1
i^3	$-i$	i
	$a+ib$	$a-ib$
$w\bar{w}$	5	5



4. When a complex number is multiplied by its conjugate the result is a **real** number.

5.

a) $\dfrac{1}{5}-\dfrac{8i}{5}=\dfrac{1-8i}{5}$

b) $\dfrac{3+2i}{-1+2i}\times\dfrac{-1-2i}{-1-2i}=\dfrac{-3-6i-2i-4i^2}{1-4i^2}=\dfrac{-3-8i+4}{1+4}=\dfrac{1-8i}{5}$