CH159b; Maths Part 2: Complex Numbers

Problems

For all the following questions,

$x = 2 + 3i$ $y = 1 - 3i$ $z = 1 + 3i$ $u = -2 + i2$ $v = 5i$ $w = 4$

1. Evaluate the following:

(a) real part of x (b) imaginary part of z (c) $2y$ (d) $x + u$

(e) ix (f) real part of iz (g) $w - 2v$ (h) $3x + iv$

(i) $x \cdot z$ (j) $y \times z$ (k) $y \cdot v$ (l) uz

2 Plot x, y, z, u, v and w on an Argand diagram

3 Evaluate the following

(a) y^* (b) v^* (c) w^* (d) $|y|$ (e) $|z|$ (f) $|v|$

4 Find the values of r and ϑ when **EACH** of x, y, z, u, v and w are expressed in the form $r\cos\vartheta + i\,r\sin\vartheta$

Answers

1.

(a) 2 (b) 3 (n.b. **not** $3i$) (c) $2-6i$ (d) $5i$

(e) $-3+2i$ (f) -3 (g) $4-10i$ (h) $1+9i$

(i) $-7+9i$ (j) 10 (k) $15+5i$ (l) $-8-4i$

3

(a) $1+3i$ (b) $-5i$ (c) 4 (d) $\sqrt{10}$ (e) $\sqrt{10}$ (f) 5

4

x	z	y	u	v	w
$r=\sqrt{13}$	$r=\sqrt{10}$	$r=\sqrt{10}$	$r=\sqrt{8}$	$r=5$	$r=4$
$\vartheta=56.3°$	$\vartheta=71.6°$	$\vartheta=288.4°$	$\vartheta=135°$	$\vartheta=90°$	$\vartheta=0°$