

COMPLEX NUMBERS – PRACTICE QUESTIONS

Jan 13

3 The complex number $2 - i$ is denoted by z .

(i) Find $|z|$ and $\arg z$. [2]

(ii) Given that $az + bz^* = 4 - 8i$, find the values of the real constants a and b . [5]

Jan 12

1 The complex number $a + 5i$, where a is positive, is denoted by z . Given that $|z| = 13$, find the value of a and hence find $\arg z$. [4]

Jan 10

8 The complex number a is such that $a^2 = 5 - 12i$.

(i) Use an algebraic method to find the two possible values of a . [5]

Jan 09

10 (i) Use an algebraic method to find the square roots of the complex number $2 + i\sqrt{5}$. Give your answers in the form $x + iy$, where x and y are exact real numbers. [6]

(ii) Hence find, in the form $x + iy$ where x and y are exact real numbers, the roots of the equation

$$z^4 - 4z^2 + 9 = 0. \quad [4]$$

Jan 08

4 The complex number $3 - 4i$ is denoted by z . Giving your answers in the form $x + iy$, and showing clearly how you obtain them, find

(i) $2z + 5z^*$, [2]

(ii) $(z - i)^2$, [3]

(iii) $\frac{3}{z}$. [3]

Jun 12

1 The complex numbers z and w are given by $z = 6 - i$ and $w = 5 + 4i$. Giving your answers in the form $x + iy$ and showing clearly how you obtain them, find

(i) $z + 3w$, [2]

(ii) $\frac{z}{w}$. [3]

Jun 15

1 The complex number $x + iy$ is denoted by z . Express $3zz^* - |z|^2$ in terms of x and y . [3]

Jun 16

10 (i) Use an algebraic method to find the square roots of the complex number $9 + 40i$. [6]

(ii) Show that $9 + 40i$ is a root of the quadratic equation $z^2 - 18z + 1681 = 0$. [1]