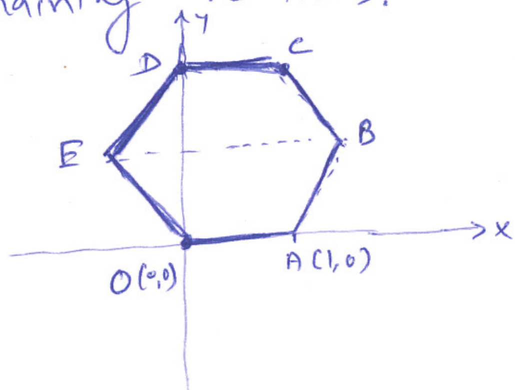
# Assignment - 1

① Find modulus and argument of $\dfrac{(3-\sqrt{2}\,i)^2}{1+2i}$.

② Convert $\dfrac{2-\sqrt{3}\,i}{1+i}$ into $x+iy$ form.

③ One of the vertices of a regular hexagon is $A(1,0)$ and the origin is at $O(0,0)$. $\overline{OA}$ is also one of the sides, as shown in the fig. Find out remaining vertices.




④ Determine region in the z-plane represented by $R(z) > 3$.

⑤ If $z_1, z_2$ are any two complex numbers, prove that $|z_1 - z_2| \geq |z_1| - |z_2|$.

⑥ If $P_1(z_1)$, $P_2(z_2)$ and $P_3(z_3)$ be any three points, prove that $\arg\left(\dfrac{z_3-z_2}{z_1-z_2}\right) = \angle P_1P_2P_3$.

Show the points in the Argand diagram.

(7) show that product of any two complex numbers $z_1$ and $z_2$ is also a complex number.

(8) Convert the complex number $z = 3+4i$ into the polar form.

(9) Convert the complex number $2e^{i\pi/4}$ into the rectangular form.

(10) Find out the real and imaginary parts of the following quantity.

$$\frac{(1-i)\cdot(2+i)}{(3+4i)}$$

(11) Simplify the following quantity and show (a) the result and (b) its complex conjugate on the Argand diagram.

$$\frac{(4-2i)(2+i)}{(3-2i)}$$

| Group | Problem |
|---|---|
| G-1 | 6 |
| G-2 | 3 |
| G-3 | 5 |
| G-4 | 1 |
| G-5 | 4 |
| G-6 | 2 |
| G-7 | 11 |
| G-8 | 7 |
| G-9 | 10 |
| G-10 | 8 |
| G-11 | 9 |

Submit by 15-8-2012.