Section A	Concepts and Skills	150 marks

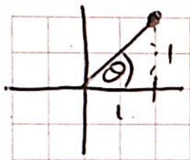
Answer **all six** questions from this section.

~~Question 1~~ Easier **(25 marks)**

(a) $(-4+3i)$ is one root of the equation $az^2+bz+c=0$, where $a, b, c \in \mathbb{R}$, and $i^2=-1$.
Write the other root.

$-4-3i$

(b) Use De Moivre's Theorem to express $(1+i)^8$ in its simplest form.



$r = \sqrt{1^2+1^2} = \sqrt{2}$

$\theta = \tan^{-1}\left(\frac{1}{1}\right) = 45^\circ$

$\therefore \left[\sqrt{2}\left(\cos 45^\circ + i\sin 45^\circ\right)\right]^8$

$= \sqrt{2}^8\left(\cos 360^\circ + i\sin 360^\circ\right)$

$= 16(1+0i)$

$= \boxed{16}$

(c) $(1+i)$ is a root of the equation $z^2+(-2+i)z+3-i=0$.
Find its other root in the form $m+ni$, where $m, n \in \mathbb{R}$, and $i^2=-1$.

$z^2 - Sz + P = 0$

$S = -(-2+i) = 1+i+z_2$

$\therefore z_2 = 2-i-1-i$

$= \boxed{1-2i}$

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