a) $3+2i$ = Root

$\Rightarrow 3-2i$ = Root also

$x^2 - x(\text{sum}) + \text{product} = 0$

$z^2 + pz + q = 0$

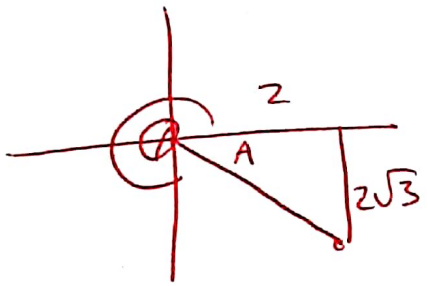
p = − Sum of Roots

q = Product of Roots

$p = -[3+2i+3-2i] = -6$ $\quad \boxed{p=-6}$

$q = (3+2i)(3-2i) = 9+4 = 13$ $\quad \boxed{q=13}$

b) i) $v = 2 - 2\sqrt{3}i$



$r = |v| = \sqrt{(2)^2 + (2\sqrt{3})^2} = 4$

$A = \tan^{-1}\left(\frac{2\sqrt{3}}{2}\right) = 60°$

$\theta = 360 - A = 300°$

$v = 4(\cos 300 + i \sin 300)$

ii) $w^2 = v$

$w = \pm\sqrt{v}$

$w = \pm [4(\cos 300 + i \sin 300)]^{1/2}$

$w = \pm 2(\cos 150 + i \sin 150)$

$w = \pm(-\sqrt{3} + i)$

$w = -\sqrt{3} + i$ or $\sqrt{3} - i$