

14. Given $z = 2 + i$ is a solution of $8z^4 - 22z^3 - 3z^2 + 62z - 15 = 0$, find all complex solutions.

$$8z^4 - 22z^3 - 3z^2 + 62z - 15 = 0$$

$$(z-2-i)(z-2+i) = z^2 - 2z + iz - 2z + 4 - 2i - zi + 2i - i^2 = z^2 - 4z + 5$$

| | | |
|----------------------------------|--|------------------|
| $8z^4 - 22z^3 - 3z^2 + 62z - 15$ | | $z^2 - 4z + 5$ |
| $8z^4 - 32z^3 + 40z^2$ | | $8z^2 + 10z - 3$ |
| $10z^3 - 43z^2 + 62z$ | | |
| $10z^3 - 40z^2 + 50z$ | | |
| $-3z^2 + 12z - 15$ | | |
| $-3z^2 + 12z - 15$ | | |
| 0 | | |

$$8z^2 + 10z - 3 = 0$$

$$D = 100 + 96 = 196$$

$$x = \frac{-10 \pm 14}{16} = -\frac{3}{2}; \frac{1}{4}$$