

1. Galileo 1638

2. Descartes

3. Leibniz - first to publish
Newton - first to discover

4. $x^3 + 6x - 7 = 0$

$$x = utv$$

$$(utv)^3 + 6(utv) - 7 = 0$$

$$u^3 + v^3 + 3uv(utv) + 6(utv) - 7 = 0$$

$$u^3 + v^3 + 3(uv+2)(utv) - 7 = 0$$

$$uv+2 = 0, uv = -2, u^3 v^3 = -8$$

$$u^3 + v^3 = 7$$

$$x^2 - 7x - 8 = 0$$

$$x = \frac{7 \pm \sqrt{49 + 32}}{2} = \frac{7 \pm 9}{2} = \frac{16}{2}, \frac{-2}{2} = 8, -1$$

$$u = 2, v = -1$$

$$\text{Root 1: } 2 - 1 = 1$$

$$\text{Root 2: } u \left(-\frac{1}{2} + \frac{i\sqrt{3}}{2} \right) + v \left(-\frac{1}{2} + \frac{i\sqrt{3}}{2} \right)$$

$$= (-1 + i\sqrt{3}) + \left(\frac{1}{2} + \frac{i\sqrt{3}}{2} \right)$$

$$= \boxed{-\frac{1}{2} + \frac{3i\sqrt{3}}{2}}$$

$$\text{Root 3: } u \left(-\frac{1}{2} - \frac{i\sqrt{3}}{2} \right) + v \left(-\frac{1}{2} - \frac{i\sqrt{3}}{2} \right)$$

$$= \boxed{-\frac{1}{2} - \frac{3i\sqrt{3}}{2}}$$

do I get points if I remembered the root 2 + 3 formula wrong but my logic is otherwise ok?