

① Galileo, published in 1638

② Rene Descartes

③ Marquis de l'Hospital, Leibniz. The first to publish it was Marquis de l'Hospital. The first to discover it was Gottfried Wilhelm Leibniz

$$(4) \quad x^3 + 6x - 7 = 0$$

$$x = u + v$$

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

$$u^3 + 3u^2v + 3uv^2 + v^3 + 6(u+v) - 7 = 0$$

$$u^3 + v^3 + 3u^2v + 3uv^2 + 6(u+v) - 7 = 0$$

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

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

$$3uv + 6 = 0$$

$$uv = -2 \rightarrow u^3v^3 = -8$$

$$u^3 + v^3 - 7 = 0$$

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

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

$$(x-8)(x+1) = 0$$

$$x = 8, \quad x = -1$$

$$u^3 = 8, \quad v^3 = -1$$

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

$$x = u + v = 2 - 1 = 1$$

$$\boxed{x = 1}$$

Other two solutions

$$\frac{(x^3 + 6x - 7)}{(x-1)} = x^2 + x + 7$$

$$\hookrightarrow x = \frac{-1 \pm \sqrt{1 - 4 \cdot 7}}{2} = \frac{-1 \pm 3i\sqrt{3}}{2}$$

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