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Q6

(1.) Galileo wrote *Discorsi*, it was published in 1638.

(2.) Descartes unified Algebra and Geometry, in 1637.

(3.) Isaac Newton and Leibniz both discovered calculus, Newton is credited with discovering it first, but Leibniz published it first.

(4.)  $x^3 + bx = 7$

$x = u - v$

$u^3 - v^3 = 7 \rightarrow (u^3 - v^3) = 7^2 \rightarrow u^6 - 2u^3v^3 + v^6 = 49$

$3uv = 6$

$uv = 2$

$u^3v^3 = 8 \rightarrow 4u^3v^3 = 32$

$u^3 + v^3 = 9$

$u^3 - v^3 = 7$

$2v^3 = 16$

$v^3 = 8 \rightarrow v = 2$

$u^3 + 8 = 9 \rightarrow u^3 = 1 \rightarrow u = 1$

$u = 2$  one root is:  $u + v = 2 + 1 = 3$

$v = 1$  Another is:  $\frac{-1 + \sqrt{3}i}{2} (2) + \frac{-1 - \sqrt{3}i}{2} (1)$

Another is:  $\frac{-1 - \sqrt{3}i}{2} (2) + \frac{-1 + \sqrt{3}i}{2} (1) = \frac{-2(1 + \sqrt{3}i)}{2} + \frac{-1 + \sqrt{3}i}{2} = \frac{-3 + \sqrt{3}i}{2}$

$\frac{1 + \sqrt{3}i}{2}$

$3$