

Real Quiz # 6 for Dr. Z.'s MathHistory

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Email DrZlinear@gmail.com as soon as I tell you (around 3:15pm)

Subject: q6

with an attachment called

q6FirstLast.pdf (e.g. q6BritannySpears.pdf)

1. (2 points) Who was the author of the 'Discorsi'? What year was it published?

Galileo  
1638

2. (1 points) Who unified Algebra and Geometry? What year was the book describing this unification published?

Descarte 1637

3. (2 point) What are the names of the two persons who discovered the differential calculus? Who was first to *discover* it? Who was the first to *publish* it?

Newton discovered it first

Leibniz published it first

4. (5 points) Use Cardano's method (no credit for other methods!) to find the three roots of the cubic equation

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

$$x = u + v$$

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

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

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

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

$$3uv+6 = 0$$

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

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

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

$$x = \frac{7 \pm \sqrt{49 - 32}}{2} = [u^3, v^3]$$

$$[u^3, v^3] = [8, -1]$$

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

$$x_1 = 2 - 1 = 1$$

$$x_2 = \frac{-1 + i\sqrt{3}}{2} (2) + \frac{-1 + i\sqrt{3}}{2} (-1) = \boxed{-\frac{1}{2} + 3i\frac{\sqrt{3}}{2}}$$

$$x_2 = \frac{-1 - i\sqrt{3}}{2} (2) - \frac{-1 - i\sqrt{3}}{2} (-1) = \boxed{-\frac{1}{2} - 3i\frac{\sqrt{3}}{2}}$$