

Attendance Quiz # 0 for Dr. Z.'s MathHistory for Lecture 0 (due no later than 10 minutes after class)

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Email to DrZlinear@gmail.com right after class

Subject:p0

with an attachment p0FirstLast.pdf

Part I: List all the "attendance questions" during the lecture, followed by your answers.

Part II:

1. (a) Express the number one hundred eighty two (in our usual, base ten, notation) in terms of powers of 5.

$$\begin{aligned} 5^0 &= 1 \\ 5^1 &= 5 \\ 5^2 &= 25 \\ 5^3 &= 125 \\ 5^4 &= 625 \end{aligned} \quad \begin{aligned} 182 &= (1 \cdot 125) + 57 \\ 57 &= (2 \cdot 25) + 7 \\ 7 &= (1 \cdot 5) + 2 \end{aligned}$$

$$\begin{aligned} 182 &= (1 \cdot 125) + (2 \cdot 25) + (1 \cdot 5) + 2 \\ &= 1 \cdot 5^3 + 2 \cdot 5^2 + 1 \cdot 5^1 + 2 \cdot 5^0 \end{aligned}$$

(b) Use the the above to express one hundred eighty two (expressed in our usual, base ten, notation) in base five.

$$\frac{1}{2^3} \frac{2}{2^2} \frac{1}{2^1} \frac{2}{2^0} \quad \text{so } 182 = 1212 \text{ in base } 5$$

2. What is the decimal name of the integer that is called "One million and one" in base 2?

$$\begin{aligned} &\frac{1}{2^6} \frac{0}{2^5} \frac{0}{2^4} \frac{0}{2^3} \frac{0}{2^2} \frac{0}{2^1} \frac{1}{2^0} \\ &= (1 \cdot 2^6) + (1 \cdot 2^0) = 64 + 1 = 65 \end{aligned}$$

Part I:

① Who was Kurt Gödel? Why was he important?

He was a mathematician and philosopher born in 1906, and was known for his Incompleteness Theorems. He said that there are statements in mathematics that are true but unprovable.

② How old was Gauss when he came up with $\frac{n(n+1)}{2}$?

He was believed to be in elementary school, around age 7 when he shocked his teachers with this discovery.

③ Finish $54 \cdot 57 = (5 \cdot 10 + 4 \cdot 1) \cdot (5 \cdot 10 + 7 \cdot 1) = 5 \cdot 5 \cdot 100 + \dots =$
 $(2 \cdot 10 + 5)$

$$(5 \cdot 5)(10) + (4 \cdot 7) \cdot (1) = 2500 + 28 = 2780$$