

Mathematical Constants in Human Biology

Mathematics · Answer Key · 8 Questions

1. What is the approximate golden ratio (phi) value often cited in the proportions of the human facial structure and the arrangement of phalanges in the fingers?

- A) 1.618**
- B) 3.141
- C) 2.718
- D) 1.414

2. In a healthy adult, the glomerular filtration rate (GFR) is approximately how many milliliters per minute, reflecting the mathematical efficiency of the kidneys?

- A) 25 ml/min
- B) 125 ml/min**
- C) 225 ml/min
- D) 325 ml/min

3. What is the standard mathematical value used for the average cardiac output in a resting adult human in liters per minute?

- A) 2.5 L/min
- B) 5.0 L/min**
- C) 7.5 L/min
- D) 10.0 L/min

4. The total surface area of the human lungs for gas exchange, when flattened, is approximately how many square meters?

- A) 10-20 m²
- B) 50-75 m²**
- C) 100-150 m²
- D) 200-250 m²

5. The human genome contains approximately how many base pairs, a massive mathematical sequence of A, T, C, and G nucleotides?

- A) 1 billion
- B) 3 billion**
- C) 6 billion
- D) 9 billion

6. The pH of human blood is tightly regulated within a narrow mathematical range. What is the standard physiological mean for arterial blood pH?

- A) 6.85
- B) 7.20
- C) 7.40**
- D) 7.65

7. Using the Rule of Nines, a common mathematical tool in medicine, what percentage of the total body surface area is represented by each entire lower limb in an adult?

- A) 9%
- B) 18%**
- C) 27%
- D) 36%

8. How many bones are typically found in the adult human skeleton, representing a specific integer sum of cranial, axial, and appendicular components?

- A) 186
- B) 206**
- C) 226
- D) 246