

Mathematical Patterns in Nature

Pre-Calculus Foundations · Answer Key · 8 Questions

1. The spiral pattern found in the shell of a Nautilus follows a logarithmic growth curve. What is this famous mathematical ratio commonly called?

- A) Golden Ratio**
- B) Pi Constant
- C) Euclidean Slope
- D) Linear Intercept

2. A honeybee colony expands its population in a way that relates to the Fibonacci sequence. Which number follows 1, 1, 2, 3, 5, 8, 13?

- A) 15
- B) 21**
- C) 20
- D) 18

3. In a stable ecosystem, if a population of rabbits doubles every year, what type of mathematical function describes this growth?

- A) Linear
- B) Constant
- C) Exponential**
- D) Inverse

4. Snowflakes exhibit six-fold radial symmetry. How many degrees are in one full rotation of a snowflake around its center point?

- A) 90
- B) 180
- C) 270
- D) 360**

5. The height of a mature sunflower can be modeled by a linear equation $y = mx + b$. If 'b' represents the starting height, what does 'b' stand for in mathematics?

- A) Y-intercept**
- B) Slope
- C) Variable
- D) Product

6. Many bird species fly in a 'V' formation to reduce air resistance. If the angle of the 'V' is 60 degrees, what is the supplementary angle?

- A) 30 degrees
- B) 120 degrees**
- C) 90 degrees
- D) 45 degrees

7. In the study of tree rings, if a tree adds a constant amount of width each year, what type of graph would show the total radius over time?

- A) Parabolic
- B) Linear**
- C) Exponential
- D) Sinusoidal

8. The vertical rise of a mountain slope compared to its horizontal distance is known as which mathematical concept?

- A) Slope**
- B) Median
- C) Mode
- D) Radius