

Advanced Fundamentals of Geometry

Geometry · Answer Key · 10 Questions

1. In Euclidean geometry, what is the measure of the sum of the interior angles of a convex polygon with n sides?

- A) $(n-1) \times 180$ degrees
- B) $(n-2) \times 180$ degrees**
- C) $(n-3) \times 180$ degrees
- D) $n \times 180$ degrees

2. According to Thales's Theorem, what is the measure of an angle inscribed in a semicircle?

- A) 45 degrees
- B) 60 degrees
- C) 90 degrees**
- D) 180 degrees

3. Which term describes the locus of all points in a plane that are equidistant from a fixed point called the focus and a fixed line called the directrix?

- A) Ellipse
- B) Hyperbola
- C) Parabola**
- D) Circle

4. For any triangle, the point of concurrency of the three medians is known as the:

- A) Incenter
- B) Circumcenter
- C) Orthocenter
- D) Centroid**

5. Euler's formula for convex polyhedra states that $V - E + F$ equals what constant?

- A) 0
- B) 1
- C) 2**
- D) 3

6. What is the maximum number of points of intersection possible between two distinct circles in a plane?

- A) 1
- B) 2**
- C) 3
- D) 4

7. In a right-angled triangle, if the side lengths are in an arithmetic progression, what is the ratio of the sides?

A) 2:3:4

B) 3:4:5

C) 5:12:13

D) $1:\sqrt{2}:\sqrt{3}$

8. Which geometric transformation preserves distances and angles, effectively mapping a figure to a congruent one?

A) Dilation

B) Shear

C) Isometry

D) Projection

9. The length of the chord of a circle is given by $2r \sin(\theta/2)$, where θ is the:

A) Inscribed angle

B) Central angle

C) Circumference angle

D) Tangent angle

10. What is the ratio of the volume of a sphere to the volume of a cylinder that has the same radius and height equal to the sphere's diameter?

A) 1:2

B) 2:3

C) 3:4

D) 4:5