



a place of mind

FACULTY OF EDUCATION

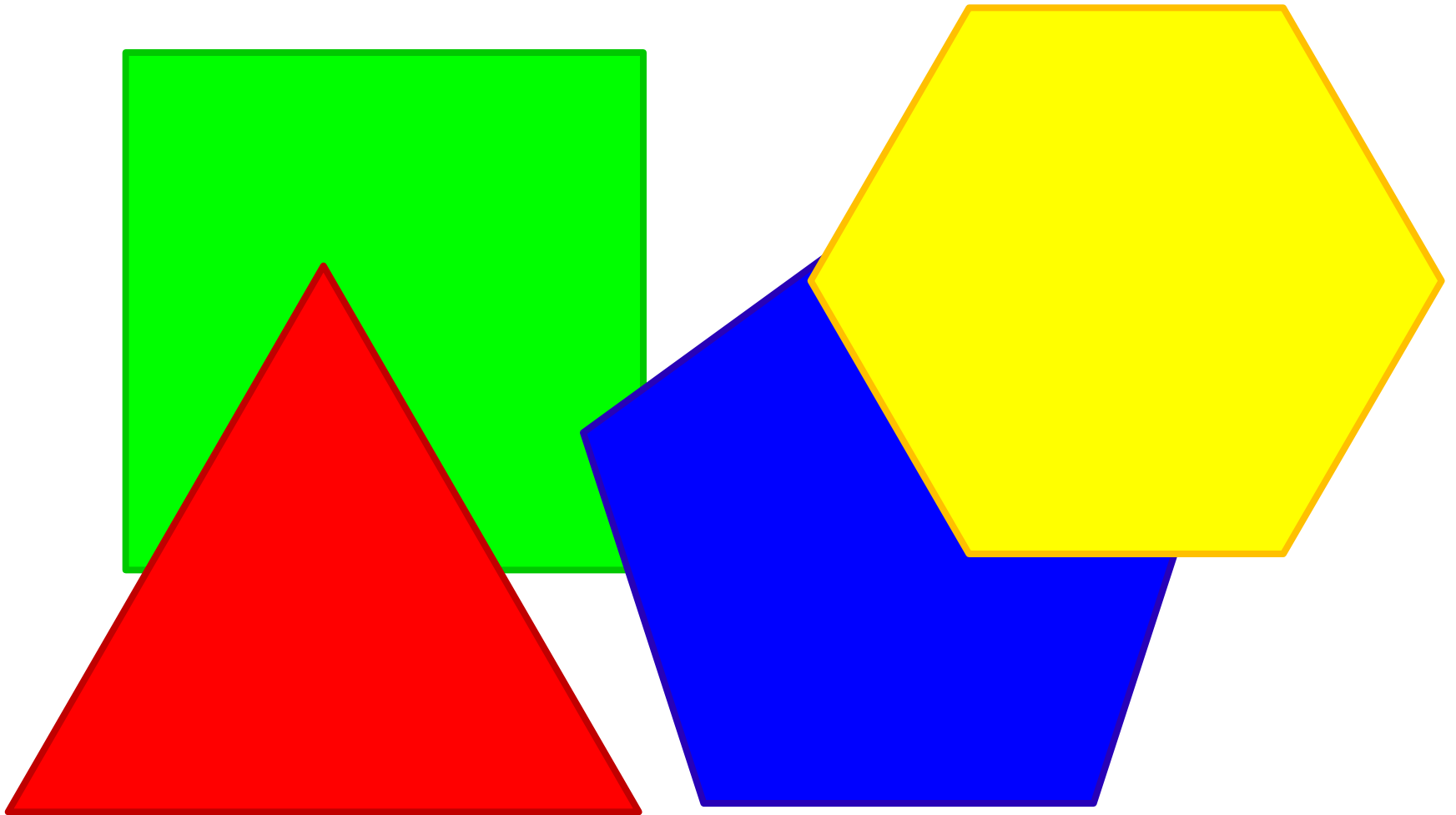
Department of
Curriculum and Pedagogy

Mathematics

Shape and Space: Polygon Angles

Science and Mathematics
Education Research Group

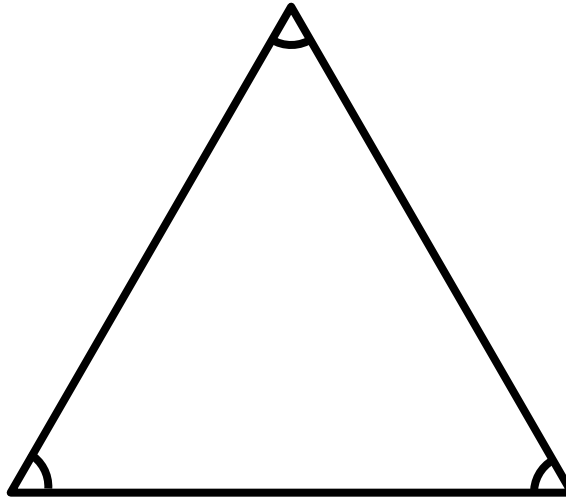
Polygon Angles



Polygon Angles I

What is the sum of all internal angles in this equilateral triangle?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

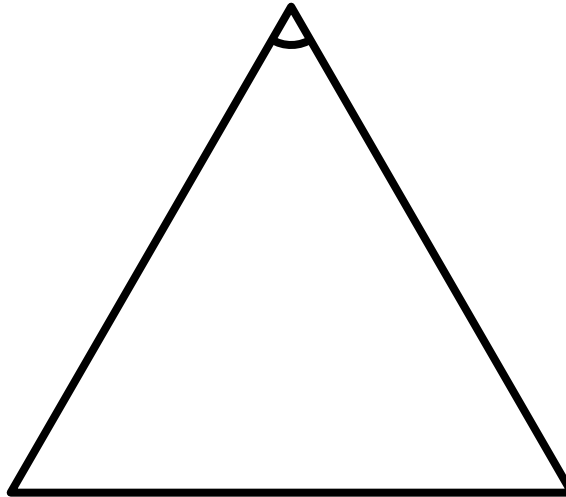
Answer: B

Justification: The sum of all internal angles in an equilateral triangle is 180° .

Polygon Angles II

What is the internal angle of this equilateral triangle?

- A. 30°
- B. 60°
- C. 90°
- D. 180°
- E. No idea



Solution

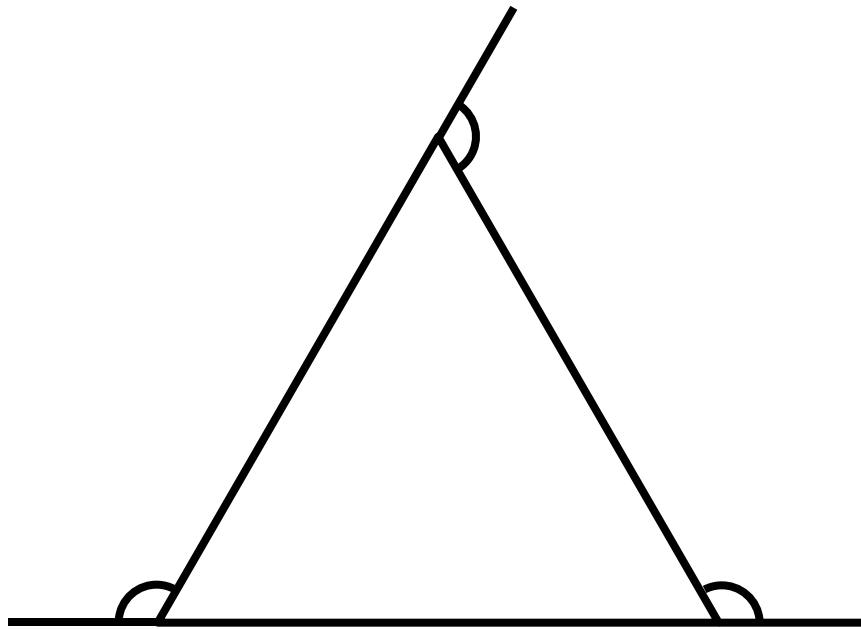
Answer: B

Justification: The sum of all internal angles is 180° , and the triangle has three corners, so $180/3=60^\circ$.

Polygon Angles III

What is the external angle of this equilateral triangle?

- A. 30°
- B. 60°
- C. 90°
- D. 120°
- E. 180°



Solution

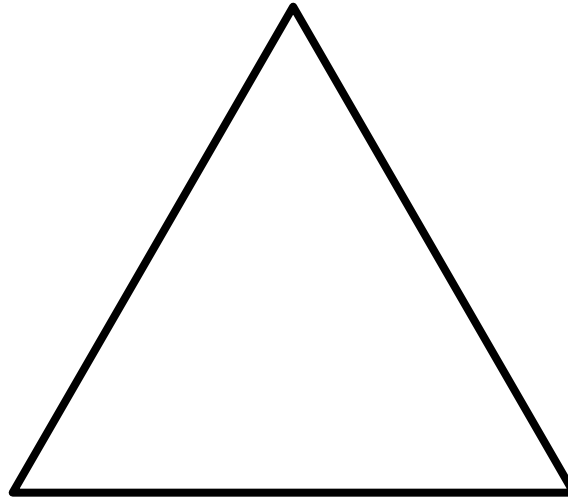
Answer: D

Justification: The internal angle and external angle add up to 180° because they share a straight line.

Polygon Angles IV

What is the sum of all external angles in this equilateral triangle?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

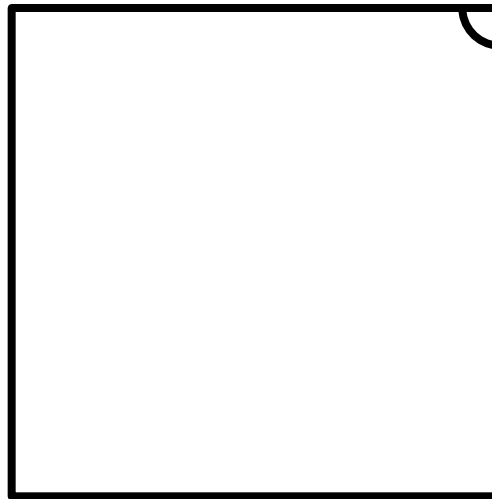
Answer: B

Justification: The sum of all external angles in an equilateral triangle is $3 \times 120 = 360^\circ$.

Polygon Angles V

What is the internal angle of this square?

- A. 30°
- B. 60°
- C. 90°
- D. 180°
- E. No idea



Solution

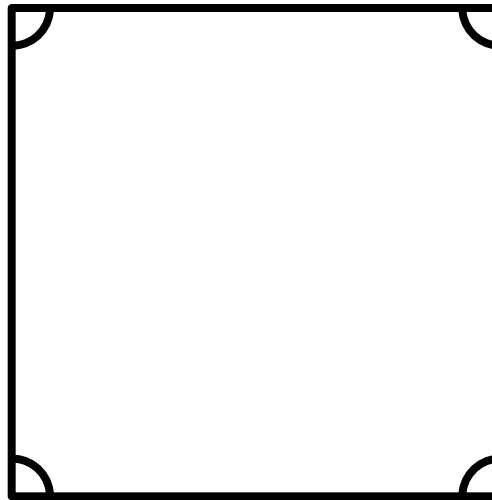
Answer: C

Justification: Squares have perpendicular sides and bases, which have a right angle of 90° .

Polygon Angles VI

What is the sum of all internal angles in this square?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

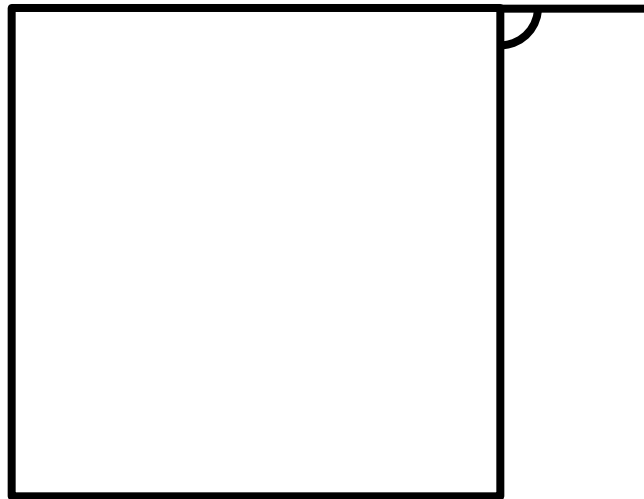
Answer: D

Justification: The sum of all internal angles in a square is $4 \times 90 = 360^\circ$.

Polygon Angles VII

What is the external angle of this square?

- A. 30°
- B. 60°
- C. 90°
- D. 120°
- E. 180°



Solution

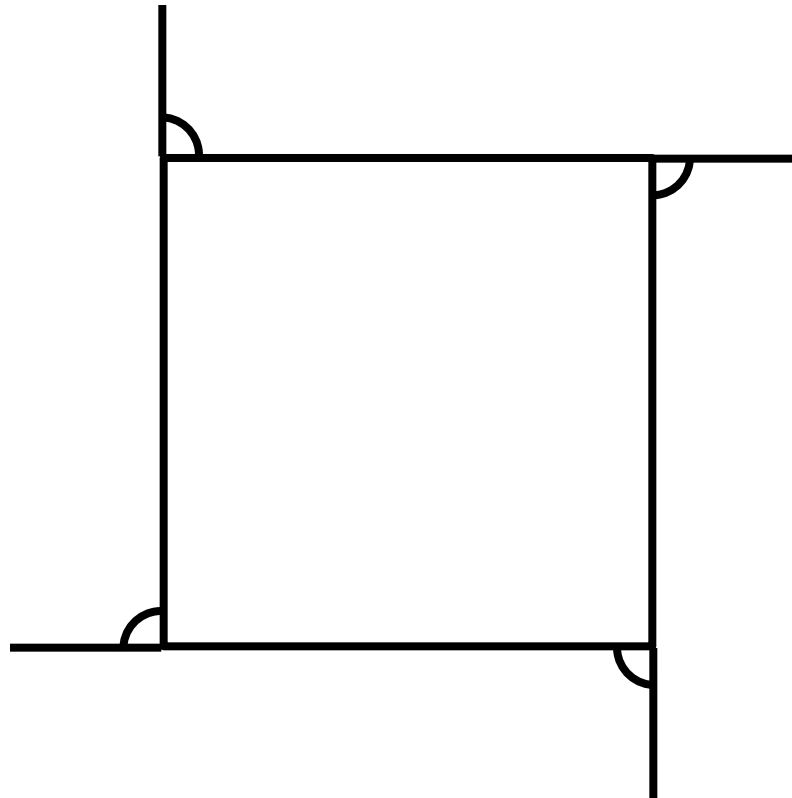
Answer: C

Justification: The internal angle and external angle add up to 180° because they share a straight line.

Polygon Angles VIII

What is the sum of all external angles in this square?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

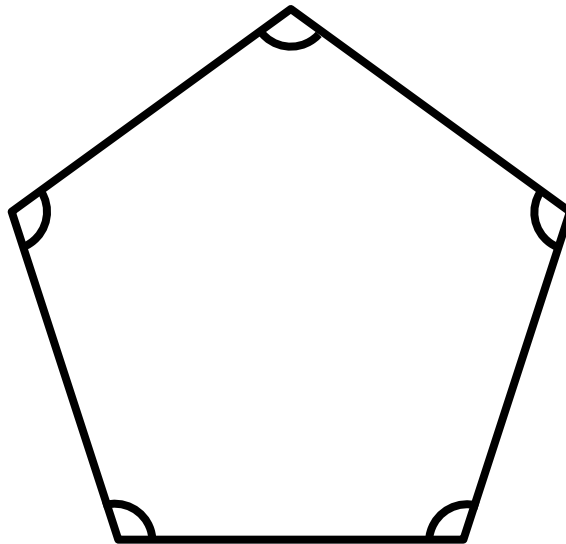
Answer: D

Justification: The sum of all external angles in a square is $4 \times 90 = 360^\circ$.

Polygon Angles IX

What is the sum of all internal angles in this regular pentagon?

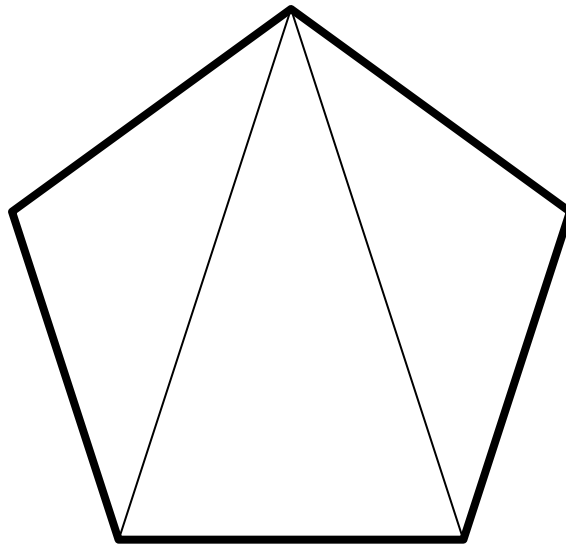
- A. 180°
- B. 360°
- C. 540°
- D. 720°
- E. No idea



Solution

Answer: C

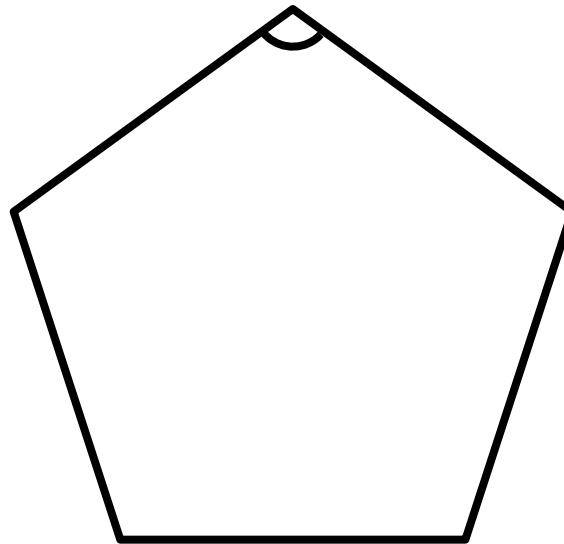
Justification: The sum of all internal angles in a pentagon is the same as three triangles (see picture below).



Polygon Angles X

What is the internal angle of this regular pentagon?

- A. 54°
- B. 72°
- C. 108°
- D. 144°
- E. No idea



Solution

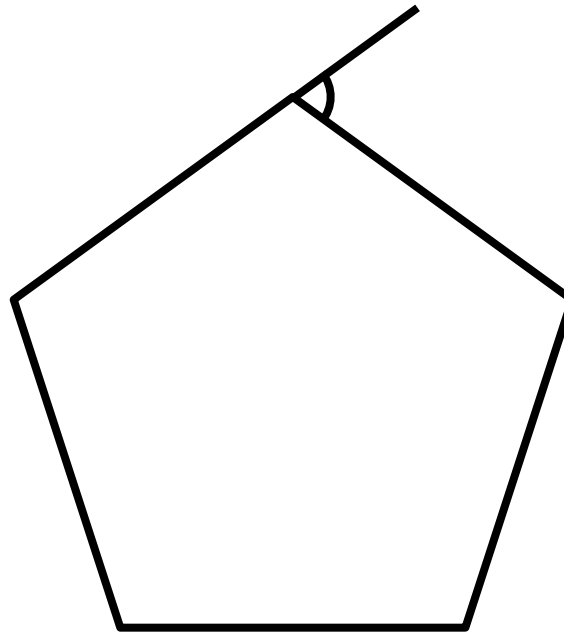
Answer: C

Justification: A pentagon has 5 corners, thus each internal angle is $540/5=108^\circ$.

Polygon Angles XI

What is the external angle of this regular pentagon?

- A. 54°
- B. 72°
- C. 108°
- D. 144°
- E. No idea



Solution

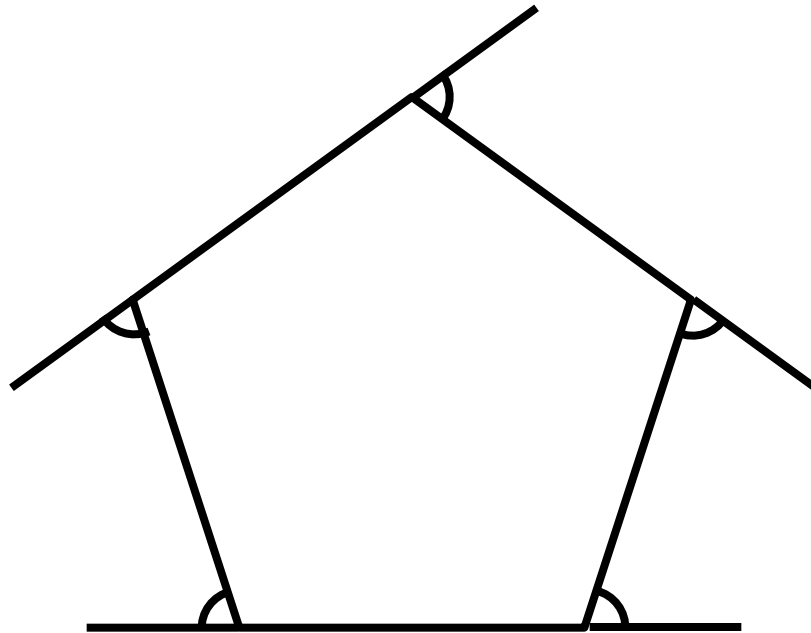
Answer: B

Justification: The internal angle and external angle add up to 180° because they share a straight line.

Polygon Angles XII

What is the sum of all external angles in this regular pentagon?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

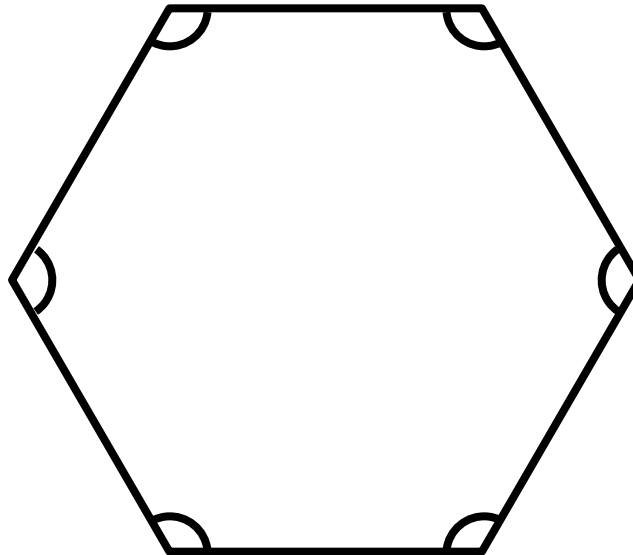
Answer: D

Justification: The sum of all external angles in a regular pentagon is $5 \times 72 = 360^\circ$.

Polygon Angles XIII

What is the sum of all internal angles in this regular hexagon?

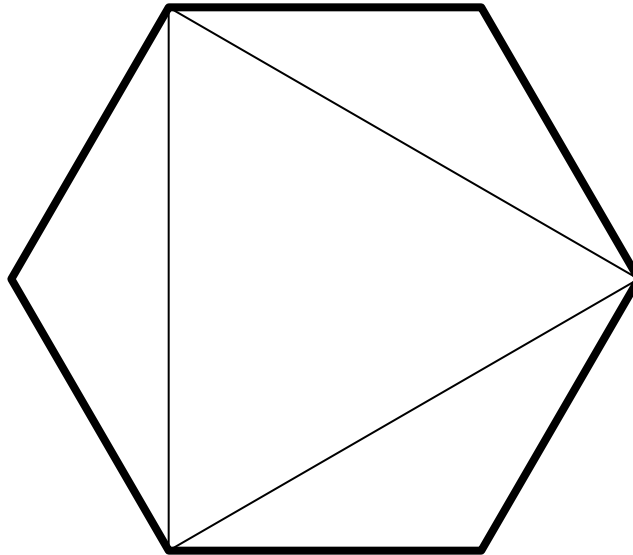
- A. 180°
- B. 360°
- C. 540°
- D. 720°
- E. No idea



Solution

Answer: D

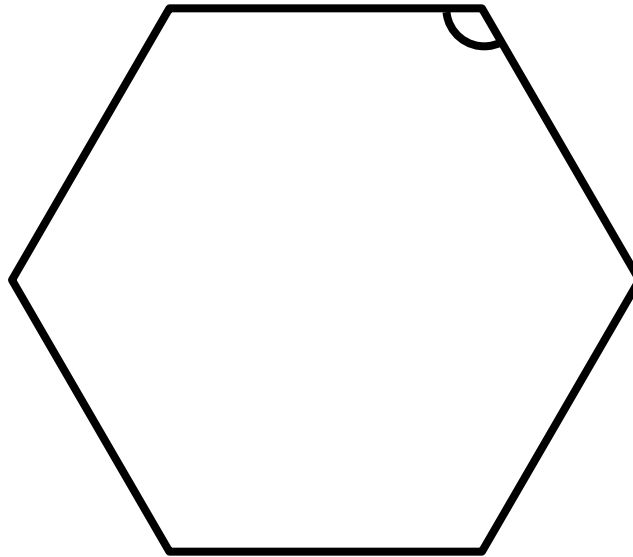
Justification: The sum of all internal angles in a hexagon is the same as four triangles (see picture below).



Polygon Angles XIV

What is the internal angle of this regular hexagon?

- A. 60°
- B. 90°
- C. 120°
- D. 144°
- E. No idea



Solution

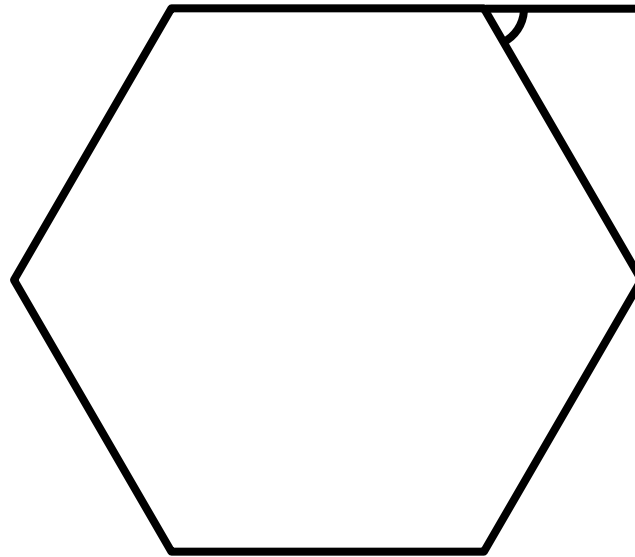
Answer: C

Justification: A hexagon has 6 corners, thus each internal angle is $720/6=120^\circ$.

Polygon Angles XV

What is the external angle of this regular hexagon?

- A. 60°
- B. 90°
- C. 120°
- D. 144°
- E. No idea



Solution

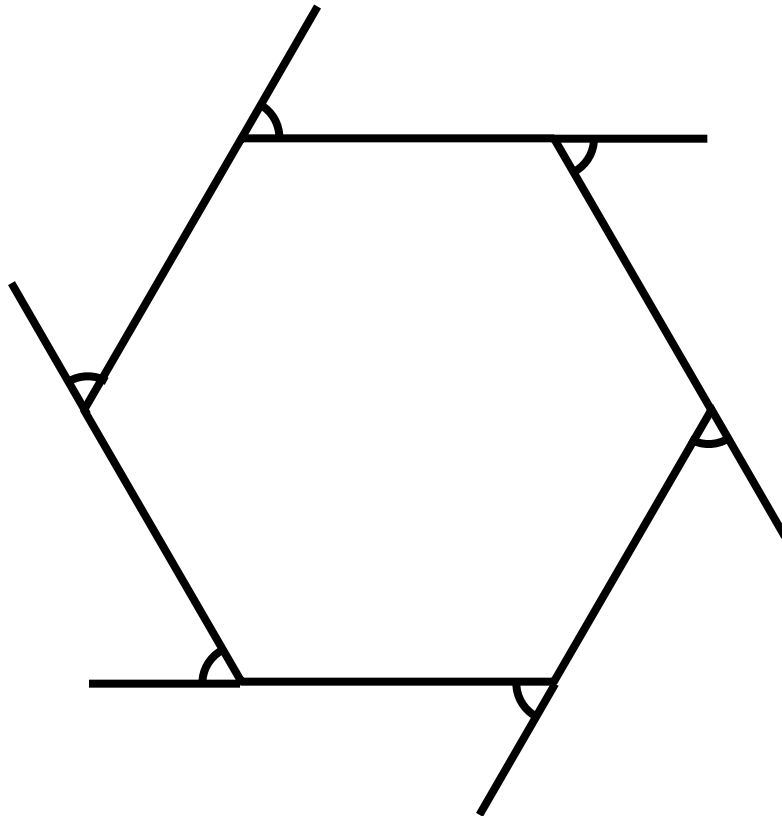
Answer: A

Justification: The internal angle and external angle add up to 180° because they share a straight line.

Polygon Angles XVI

What is the sum of all external angles in this regular hexagon?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

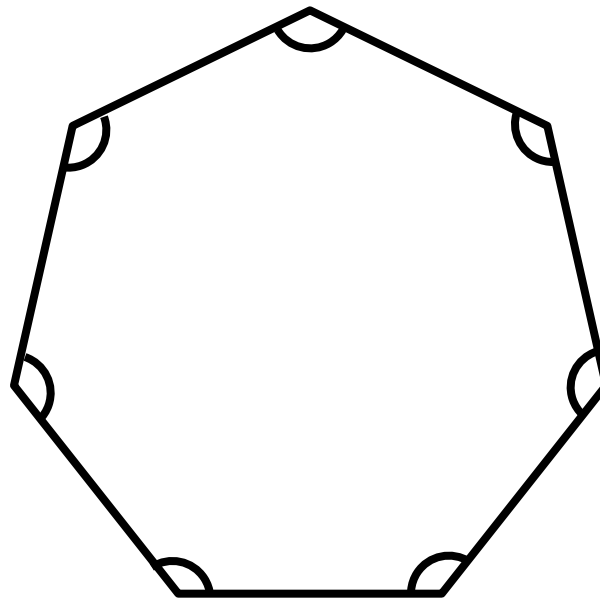
Answer: D

Justification: The sum of all external angles in a regular hexagon is $6 \times 60 = 360^\circ$.

Polygon Angles XVII

What is the sum of all internal angles in this regular heptagon?

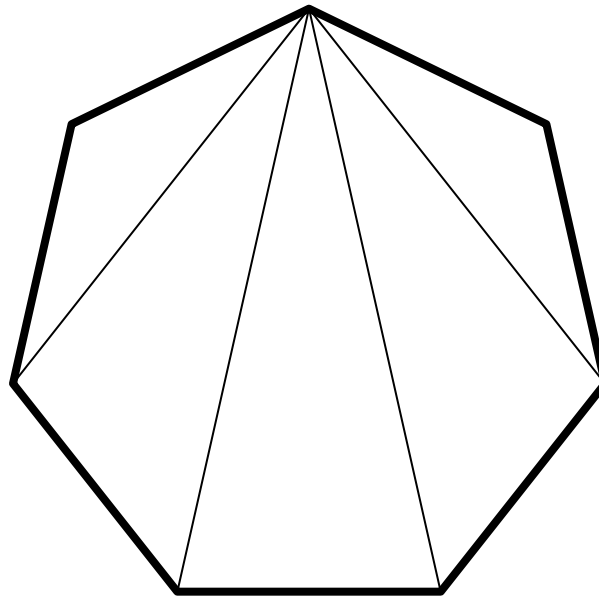
- A. 540°
- B. 720°
- C. 900°
- D. 1080°
- E. No idea



Solution

Answer: C

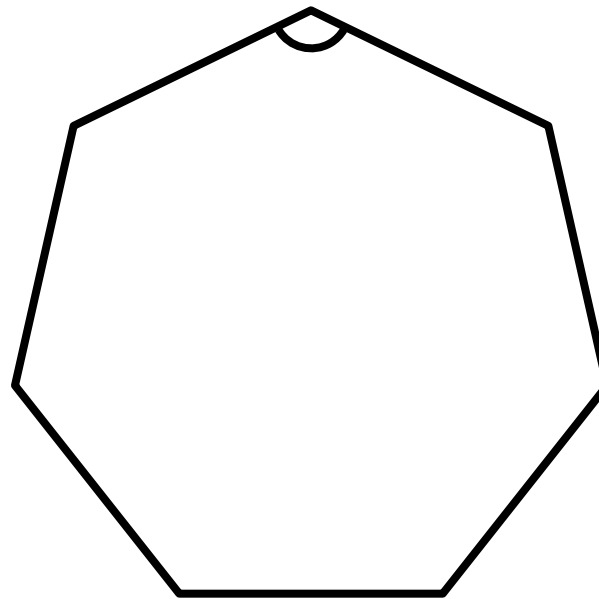
Justification: The sum of all internal angles in a heptagon is the same as five triangles (see picture below).



Polygon Angles XVIII

What is the internal angle of this regular heptagon?

- A. 70°
- B. $\sim 129^\circ$
- C. $\sim 142^\circ$
- D. $\sim 157^\circ$
- E. No idea



Solution

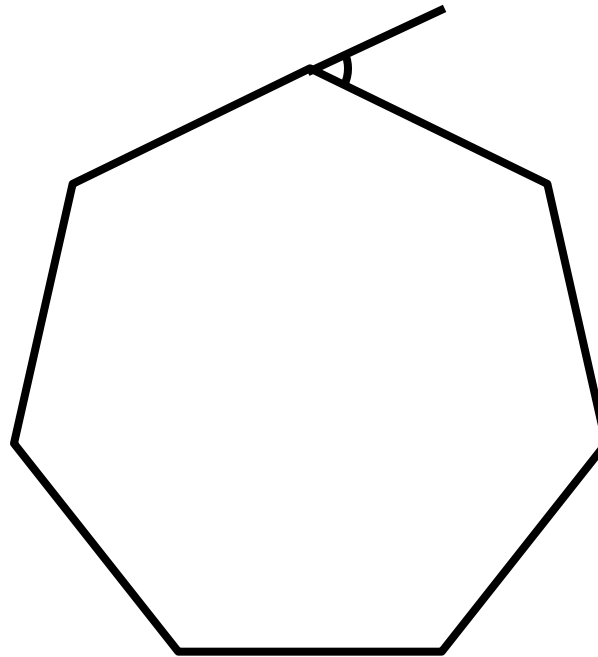
Answer: B

Justification: A heptagon has 7 corners, thus each internal angle is $900/7 \approx 129^\circ$.

Polygon Angles XIX

What is the external angle of this regular heptagon?

- A. $\sim 37^\circ$
- B. $\sim 42^\circ$
- C. $\sim 51^\circ$
- D. $\sim 62^\circ$
- E. No idea



Solution

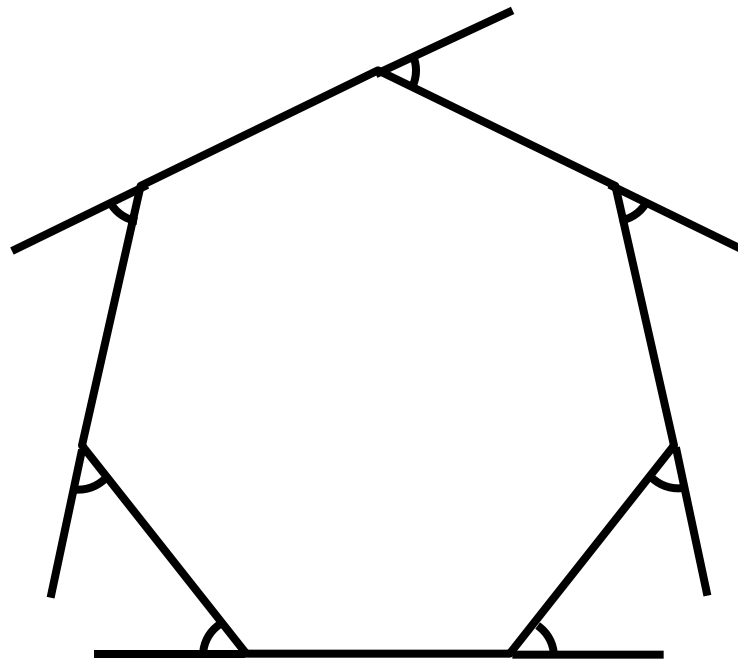
Answer: C

Justification: The internal angle and external angle add up to 180° because they share a straight line.

Polygon Angles XX

What is the sum of all external angles in this regular heptagon?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

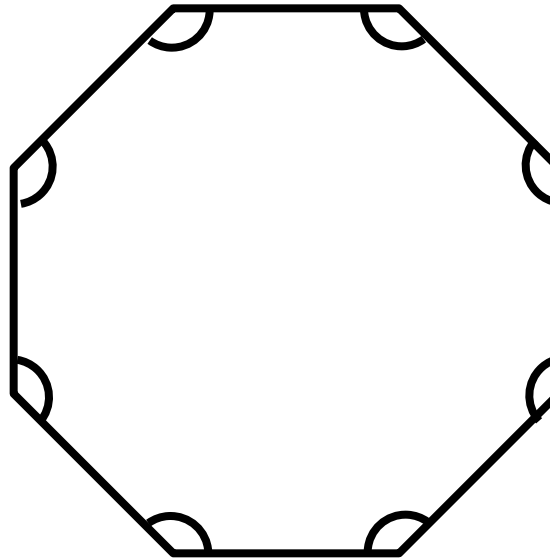
Answer: D

Justification: The sum of all external angles in a regular heptagon is $7 \times 51.2857\dots = 360^\circ$.

Polygon Angles XXI

What is the sum of all internal angles in this regular octagon?

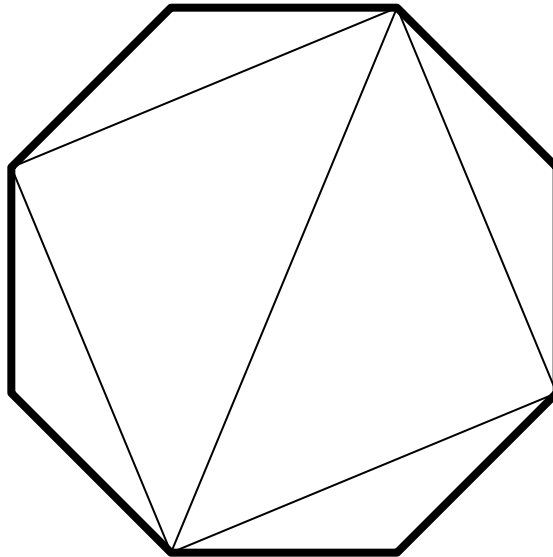
- A. 540°
- B. 720°
- C. 900°
- D. 1080°
- E. No idea



Solution

Answer: D

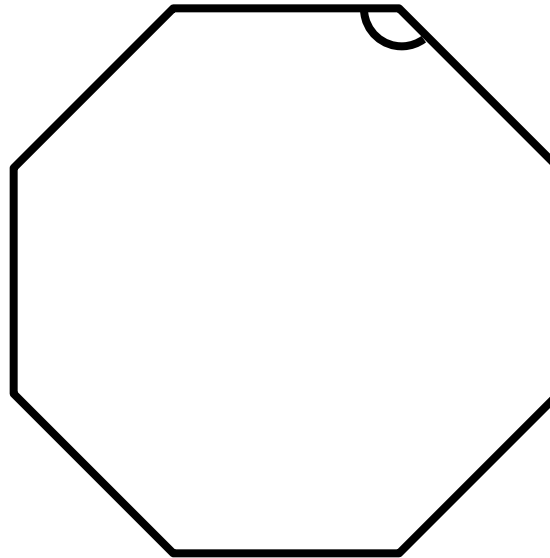
Justification: The sum of all internal angles in a octagon is the same as six triangles (see picture below).



Polygon Angles XXII

What is the internal angle of this regular octagon?

- A. 90°
- B. 110°
- C. 120°
- D. 135°
- E. No idea



Solution

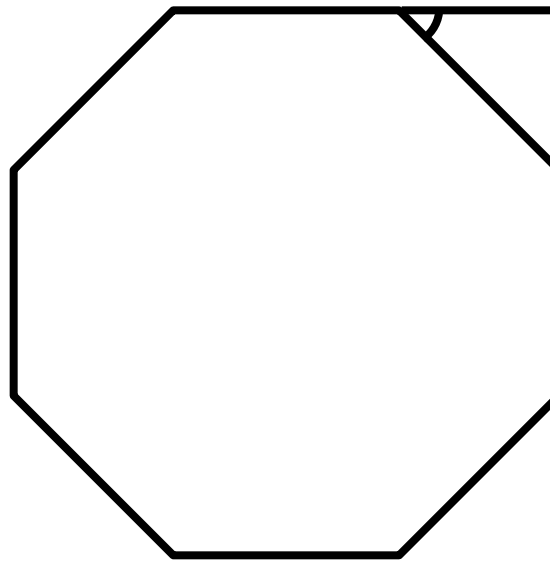
Answer: D

Justification: An octagon has 8 corners, thus each internal angle is $1080/8=135^\circ$.

Polygon Angles XXIII

What is the external angle of this regular octagon?

- A. 20°
- B. 30°
- C. 45°
- D. 60°
- E. No idea



Solution

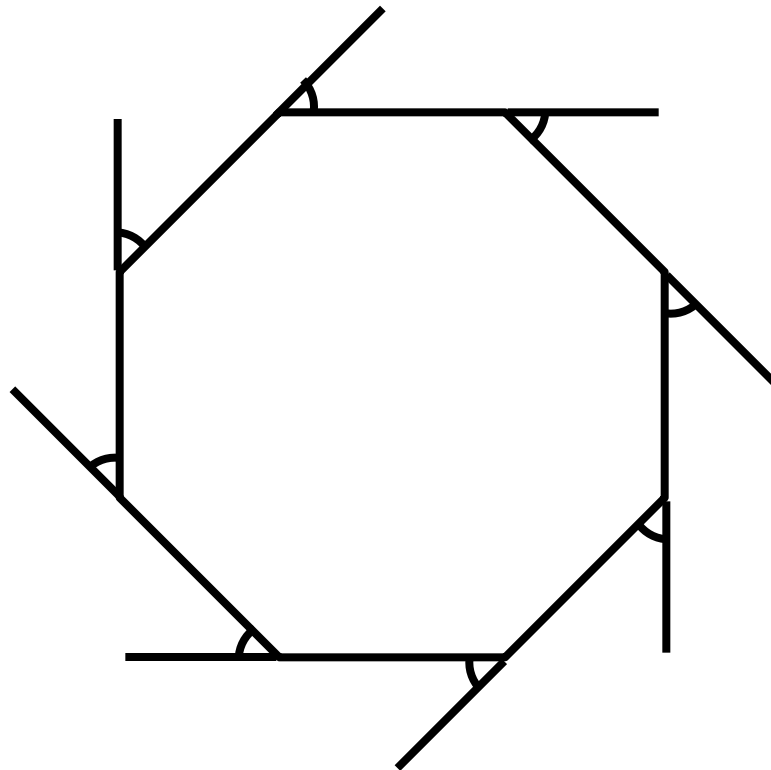
Answer: C

Justification: The internal angle and external angle add up to 180° because they share a straight line..

Polygon Angles XXIV

What is the sum of all external angles in this regular octagon?

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

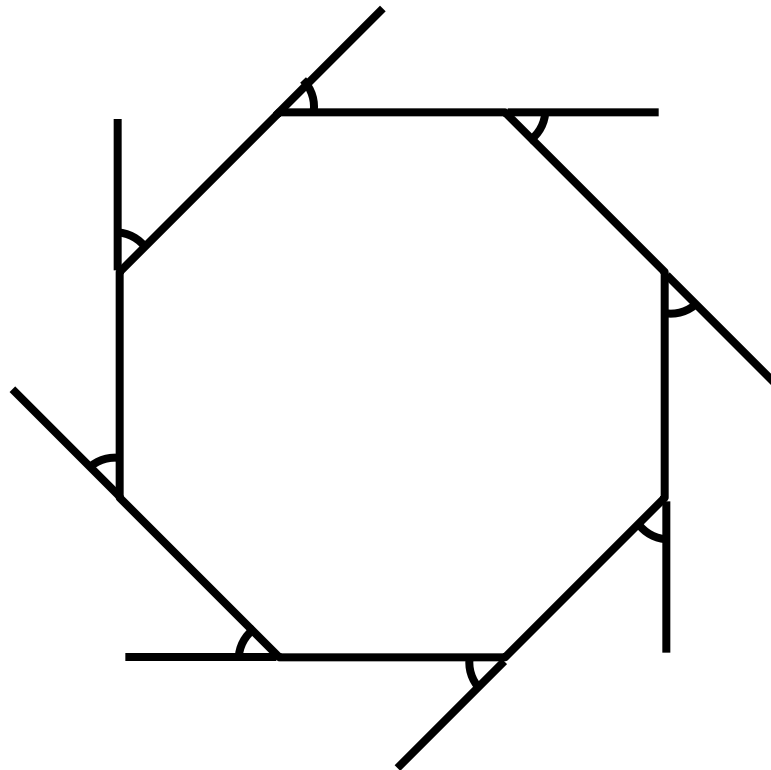
Answer: D

Justification: The sum of all external angles in a regular octagon is $8 \times 45 = 360^\circ$.

Polygon Angles XXV

From what we have seen before, infer the total external angle for ANY convex polygon.

- A. 90°
- B. 180°
- C. 270°
- D. 360°
- E. No idea



Solution

Answer: D

Justification: The sum of all external angles in any convex polygon is 360° , because the angles have to turn all the way around in a circle like fashion to complete the shape.