

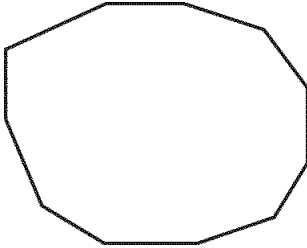
Understanding Polygon Properties Review Package

(Answers at the back)

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ___ 1. Determine the sum of the measures of the interior angles of this polygon.

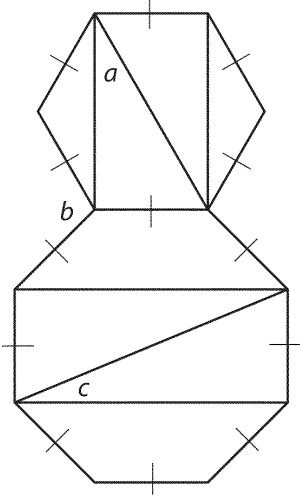


- a. 1080°
b. 1260°
c. 1620°
d. 1440°
- ___ 2. Determine the sum of the measures of the angles in a 16-sided convex polygon.
- a. 2700°
b. 2520°
c. 2340°
d. 2880°
- ___ 3. Each interior angle of a regular convex polygon measures 144° .
How many sides does the polygon have?
- a. 10
b. 11
c. 8
d. 9
- ___ 4. Each interior angle of a regular convex polygon measures 162° .
How many sides does the polygon have?
- a. 16
b. 19
c. 18
d. 20
- ___ 5. With which of the following polygons could you create a tiling pattern?
Choose the best answer.
- a. an equilateral triangle
b. a square
c. a rectangle
d. all of the above

___ 6. With which of the following polygons could you create a tiling pattern?

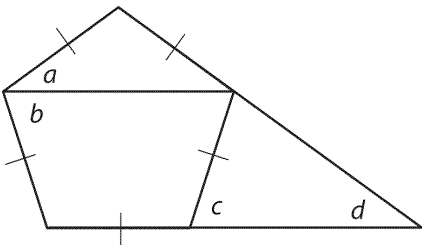
- a. a regular hexagon
- b. a regular pentagon
- c. a regular octagon
- d. none of the above

___ 7. Determine the value of b .



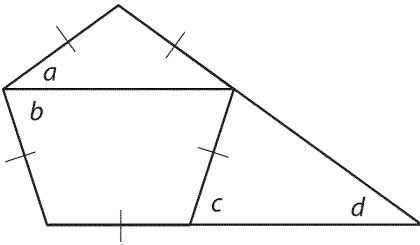
- a. 144°
- b. 154°
- c. 126°
- d. 105°

___ 8. Determine the value of a .



- a. 34°
- b. 30°
- c. 36°
- d. 32°

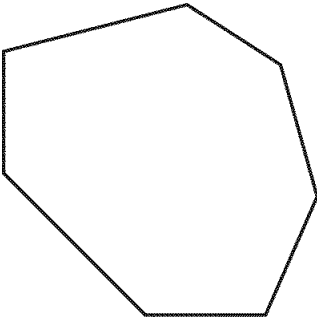
9. Determine the value of d .



- a. 48°
- b. 36°
- c. 52°
- d. 42°

Short Answer

10. Determine the sum of the measures of the interior angles of this seven-sided polygon. Show your calculation.

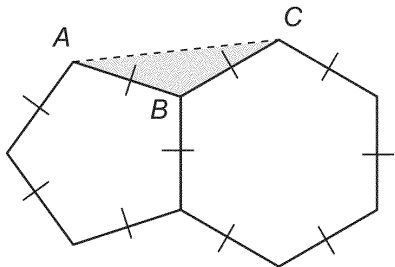


11. Abbie is measuring the exterior angles of a convex pentagon. So far, she has measured 90° , 90° , 120° , and 40° . What is the measure of the last exterior angle? Show your calculation.

Problem

12. A floor tiler designs custom floors using tiles in the shape of regular polygons. The tiler uses three different tile shapes to cover a floor, all with the same side length. At each corner, there is one square and one hexagon. What is the third tile shape? Draw part of the tiling.

13. A regular hexagon shares a side with a regular pentagon, as shown. Determine the measures of the interior angles of $\triangle ABC$. Show your solution.



Understanding Polygon Properties

Answer Section

MULTIPLE CHOICE

1. ANS: C
2. ANS: B
3. ANS: A
4. ANS: D
5. ANS: D
6. ANS: A
7. ANS: D
8. ANS: C
9. ANS: B

SHORT ANSWER

10. ANS:
 $180^\circ(7 - 2) = 900^\circ$
11. ANS:
 $360^\circ - 90^\circ - 90^\circ - 120^\circ - 40^\circ = 20^\circ$

PROBLEM

12. ANS:
The measure of an interior angle of a square is 90° .
The measure of an interior angle of a regular hexagon is 120° .
This leaves a gap of $360^\circ - 90^\circ - 120^\circ = 150^\circ$.
Determine the number of sides, n , of a regular polygon with 150° -angles:

$$\frac{(n - 2)180^\circ}{n} = 150^\circ$$

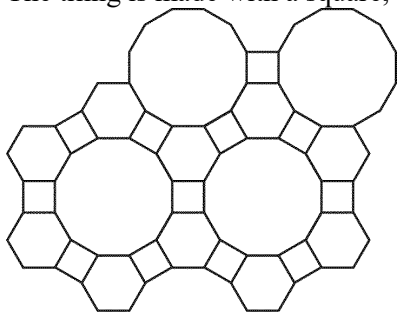
$$180^\circ n - 360^\circ = 150^\circ n$$

$$n(180^\circ - 150^\circ) = 360^\circ$$

$$30^\circ n = 360^\circ$$

$$n = 12$$

The measure of the interior angles in a regular 12-sided polygon (dodecagon) is 150° .
The tiling is made with a square, a regular hexagon, and a regular dodecagon:



13. ANS:

The measure of each interior angle of a regular pentagon is 108° .

The measure of each interior angle of a regular hexagon is 120° .

Therefore,

$$\angle B = 360^\circ - 120^\circ - 108^\circ$$

$$\angle B = 132^\circ$$

Then,

$$\angle A + \angle C = 180^\circ - 132^\circ$$

$$\angle A + \angle C = 48^\circ$$

Since the hexagon and pentagon have equal side lengths, $\triangle ABC$ must be isosceles. Therefore, $\angle A$ and $\angle C$ must be equal, and each is half of 48° .

$$\angle A = 24^\circ$$

$$\angle C = 24^\circ$$