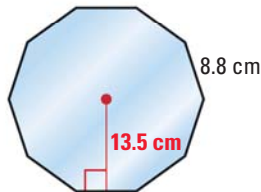


POLYGON PROBLEMS ON TAKS

Below are examples of polygon problems in multiple choice format. Try solving the problems before looking at the solutions. (Cover the solutions with a piece of paper.) Then check your solutions against the ones given.

1. A glass window is a regular decagon with a side length of about 8.8 centimeters and an apothem of about 13.5 centimeters. What is the approximate area of the glass window?



- A 119 cm²
 B 594 cm²
 C 1188 cm²
 D 2376 cm²

Solution

A decagon has 10 sides. The perimeter of the window is $P = 10(8.8) = 88$ centimeters.

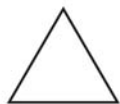
The area of the window is:

$$A = \frac{1}{2}aP = \frac{1}{2}(13.5)(88) = 594 \text{ cm}^2$$

The correct answer is B.

- (A) (B) (C) (D)

2. Each figure shows the number of diagonals of the polygon. What is the number of diagonals in a heptagon?



0 diagonals



2 diagonals



5 diagonals



9 diagonals

- F 13
 G 14
 H 19
 J 20

Solution

Make a table and look for a pattern.

Number of sides	3	4	5	6	7
Number of diagonals	0	2	5	9	?

+2 +3 +4

The pattern for how the number of diagonals increases is identified with the red arrows.

A heptagon has 7 sides. To determine the number of diagonals in a heptagon, follow the pattern by adding 5 to the number of diagonals in a hexagon.

$$9 + 5 = 14$$

So, a heptagon has 14 diagonals.

The correct answer is G.

- (F) (G) (H) (J)