

# Math Kangaroo

## Level 5-6

### 2D Geometry



Warm Up



Instruction



Geometry  
Problems



Wrap Up

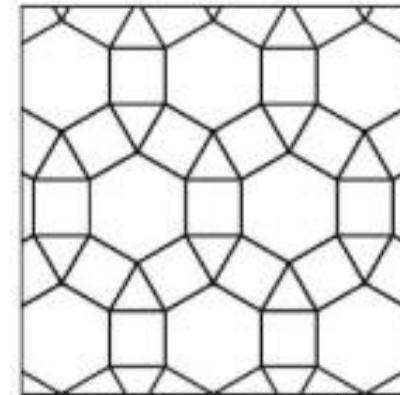


Bonus Slides

# Warm Up

(MK 2019 #6)

Which of the following geometric figures is not in the design to the right?



- (A) triangle
- (B) square
- (C) regular hexagon
- (D) regular octagon
- (E) regular dodecagon

# What we have learned

Lesson 2: Patterns ✓

Lesson 3: Algebraic Thinking ✓

Lesson 4: Ratio & Proportion ✓

Lesson 5: Multiples, Factors, and Divisibility ✓

Lesson 6: Time, Clocks, and Calendars ✓

Lesson 7: 2D Geometry

Lesson 8: 3D Geometry

Lesson 9: Hands On

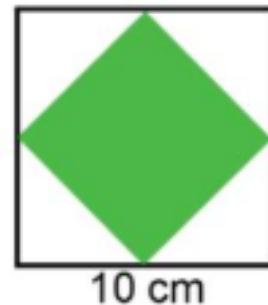
# Geometry Problems

In Math Kangaroo we can see many problems that include geometric shapes: triangles, squares, rectangles, circles, hexagons, octagons, etc. Usually, in these problems you need to find the perimeter, area, or different angles of the shapes.

- The **perimeter** of a shape is the distance around the shape. It is the total length of the shape's sides.
- The **area** of a shape is the amount of space on the flat surface of a shape. The area of a geometric shape is the number of unit squares that cover its surface.

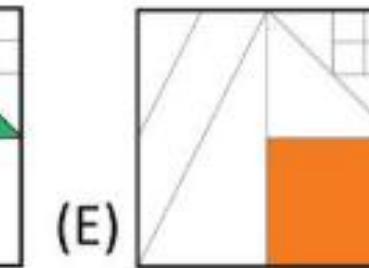
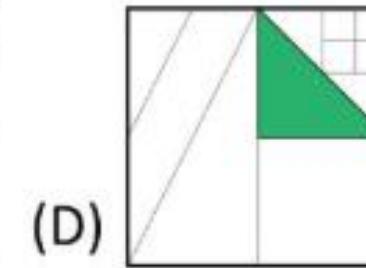
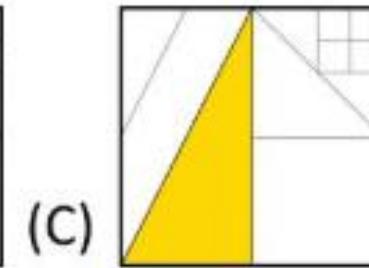
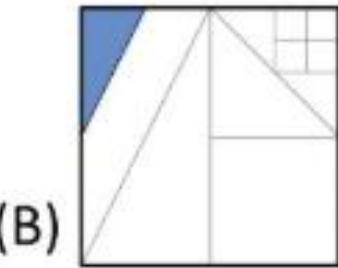
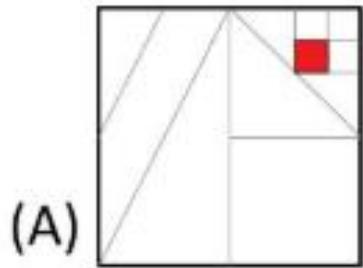
(MK 2016 #5)

1. Cathy draws a square with a side length of 10 centimeters. She joins the midpoints of the sides to make a smaller square. What is the area of the smaller square?



(MK 2021 #10)

2. There is a square with line segments drawn inside it. The line segments are drawn either from the vertices or the midpoints of other line segments. We colored  $1/8$  of the large square. Which one is our coloring?

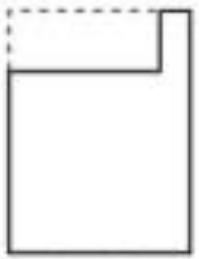


(MK 2000 #15)

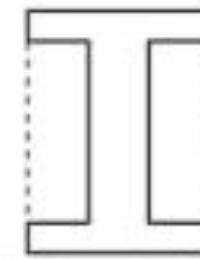
3. Each of five neighbors owns a rectangular plot of land with the same area. The flower gardens of their land are fenced in (solid line in the pictures). Who has the longest fence?



(A) Mr. Adam



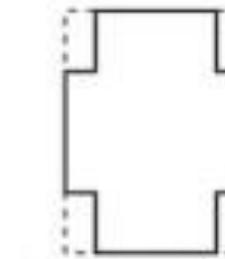
(B) Mr. John



(C) Mr. Jack



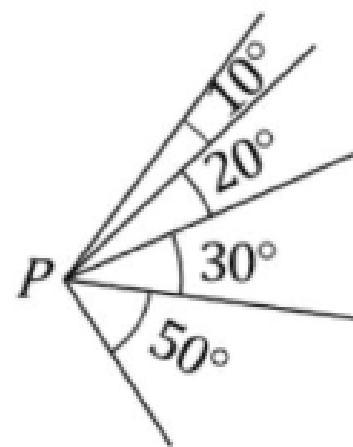
(D) Mr. Peter



(E) Mr. Mark

(MK 2002 #16)

4. How many convex angles with different measures are made by the rays with  $P$  as the vertex of the angles (see picture)? A convex angle is an angle that is larger than a zero angle and smaller than a straight angle.



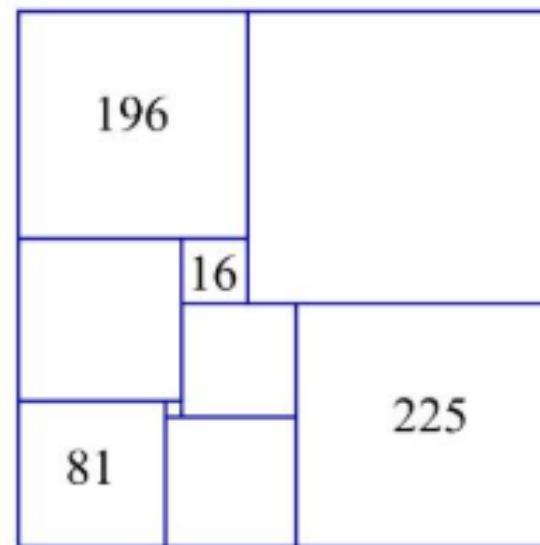
(MK 2005 #19)

5. The frame of a rectangular painting was made from wooden pieces of the same width. What is the width of those pieces if the outer perimeter of the frame is 8 decimeters longer than the inner perimeter?



(MK 2010 #24)

6. The rectangle shown in the picture was divided into squares with different side lengths. The areas of some of these squares are given. What is the area of the entire rectangle?



## Bonus Question

(MK 2003 #28)

The shaded figure in the picture to the right consists of five identical isosceles right triangles. What is the area of the shaded figure?

