

Perimeter Pair Patrol

Find rectangle pairs with the same distance around.

3.GSR.8.2 "Investigate and describe how rectangles with the same perimeter can have different areas or how rectangles with the same area can have different perimeters."

NAME _____

DATE _____

SAME PERIMETER, DIFFERENT AREA

Both rectangles have the same perimeter, but they have different areas. Find perimeter by adding all four sides and area by multiplying length $\times$ width.

A 3-unit-by-7-unit rectangle and a 5-unit-by-5-unit rectangle both have a perimeter of 20 units. Their areas are 21 and 25 square units, so they are SAME.

NOT SAME PERIMETER, DIFFERENT AREA

The rectangles do not have both the same perimeter and different areas. Their perimeters may be different, or their areas may not be different.

A 2-unit-by-4-unit rectangle has a perimeter of 12 units. A 3-unit-by-5-unit rectangle has a perimeter of 16 units, so they are NOT SAME.

1 SORT _____ 8 items

For each pair, circle SAME or NOT SAME, then, for two pairs you choose, show the perimeter and area of both rectangles and explain your choice.

- | | | | |
|----|---|----------------------------|--------------------------------|
| 1. | 1. Rectangle A: 2 units by 8 units. Rectangle B: 4 units by 6 units. | ☐ SAME | ☐ NOT SAME |
| 2. | 2. Rectangle A: 3 units by 9 units. Rectangle B: 4 units by 8 units. | ☐ SAME | ☐ NOT SAME |
| 3. | 3. Rectangle A: 2 units by 10 units. Rectangle B: 4 units by 7 units. | ☐ SAME | ☐ NOT SAME |
| 4. | 4. Rectangle A: 1 unit by 12 units. Rectangle B: 5 units by 8 units. | ☐ SAME | ☐ NOT SAME |
| 5. | 5. Rectangle A: 6 units by 6 units. Rectangle B: 3 units by 10 units. | ☐ SAME | ☐ NOT SAME |
| 6. | 6. Rectangle A: 3 units by 11 units. Rectangle B: 5 units by 8 units. | ☐ SAME | ☐ NOT SAME |
| 7. | 7. Rectangle A: 1 unit by 13 units. Rectangle B: 6 units by 8 units. | ☐ SAME | ☐ NOT SAME |
| 8. | 8. Rectangle A: 3 units by 10 units. Rectangle B: 6 units by 7 units. | ☐ SAME | ☐ NOT SAME |

2 PROVE IT Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ HOW I KNEW _____

ITEM # _____ HOW I KNEW _____

3 MAKE YOUR OWN One of each

Write one new pair of rectangles for SAME and one new pair of rectangles for NOT SAME.

SAME _____

NOT SAME _____

CHALLENGE

Make three different rectangles with the same perimeter, write each area, and make sure all three areas are different.

PART 1 • SORT

#	ITEM	CATEGORY	WHY
1	1. Rectangle A: 2 units by 8 units. Rectangle B: 4 units by 6 units.	SAME	Both perimeters are 20 units. The areas are 16 and 24 square units.
2	2. Rectangle A: 3 units by 9 units. Rectangle B: 4 units by 8 units.	SAME	Both perimeters are 24 units. The areas are 27 and 32 square units.
3	3. Rectangle A: 2 units by 10 units. Rectangle B: 4 units by 7 units.	NOT SAME	The perimeters are 24 units and 22 units.
4	4. Rectangle A: 1 unit by 12 units. Rectangle B: 5 units by 8 units.	SAME	Both perimeters are 26 units. The areas are 12 and 40 square units.
5	5. Rectangle A: 6 units by 6 units. Rectangle B: 3 units by 10 units.	NOT SAME	The perimeters are 24 units and 26 units.
6	6. Rectangle A: 3 units by 11 units. Rectangle B: 5 units by 8 units.	NOT SAME	The perimeters are 28 units and 26 units.
7	7. Rectangle A: 1 unit by 13 units. Rectangle B: 6 units by 8 units.	SAME	Both perimeters are 28 units. The areas are 13 and 48 square units.
8	8. Rectangle A: 3 units by 10 units. Rectangle B: 6 units by 7 units.	SAME	Both perimeters are 26 units. The areas are 30 and 42 square units.

PART 2 • PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 • MAKE YOUR OWN (SAMPLE ANSWERS)

- **SAME:** A 2-unit-by-7-unit rectangle and a 4-unit-by-5-unit rectangle both have a perimeter of 18 units. Their areas are 14 and 20 square units.
- **NOT SAME:** A 4-unit-by-4-unit rectangle has a perimeter of 16 units. A 3-unit-by-6-unit rectangle has a perimeter of 18 units.

Challenge: 1 unit by 14 units has perimeter 30 units and area 14 square units. 2 units by 13 units has perimeter 30 units and area 26 square units. 3 units by 12 units has perimeter 30 units and area 36 square units.

For Part 2, students should show or state both perimeters and both areas for each chosen pair. Accept equivalent rectangle dimensions written in either order.