Relate Perimeter and Area

Rectangles with the same perimeter can have different areas.

Look at the rectangles below. Each rectangle has a perimeter of 24 cm, but their areas are different.

Remember . . .
Area \(A\) = length \(l\) \(\times\) width \(w\)

Rectangle A: 1 cm \(\times\) 11 cm
Area = 11 cm\(^2\)

Rectangle B: 2 cm \(\times\) 10 cm
Area = 20 cm\(^2\)

Rectangle C: 3 cm \(\times\) 9 cm
Area = 27 cm\(^2\)

Rectangle D: 4 cm \(\times\) 8 cm
Area = 32 cm\(^2\)

Rectangle E: 6 cm \(\times\) 6 cm
Area = 36 cm\(^2\)

Rectangle E is the rectangle with the greatest area, 36 cm\(^2\).

Use the grid to draw rectangles for the given perimeter. Name the length and width of the rectangle with the greatest area.

1. Perimeter = 12 cm
2. Perimeter = 28 cm
Relate Perimeter and Area

Rectangles with the same perimeter can have different areas.

Look at the rectangles below. Each rectangle has a perimeter of 24 cm, but their areas are different.

<table>
<thead>
<tr>
<th>Rectangle A</th>
<th>Rectangle B</th>
<th>Rectangle C</th>
<th>Rectangle D</th>
<th>Rectangle E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cm x 11 cm</td>
<td>2 cm x 10 cm</td>
<td>3 cm x 9 cm</td>
<td>4 cm x 8 cm</td>
<td>6 cm x 6 cm</td>
</tr>
<tr>
<td>Area = 11 cm²</td>
<td>Area = 20 cm²</td>
<td>Area = 27 cm²</td>
<td>Area = 32 cm²</td>
<td>Area = 36 cm²</td>
</tr>
</tbody>
</table>

Rectangle E is the rectangle with the greatest area, 36 cm².

Use the grid to draw rectangles for the given perimeter. Name the length and width of the rectangle with the greatest area. Check students’ drawings.

1. Perimeter = 12 cm
   
   \[ l = 3 \text{ cm}, \ w = 3 \text{ cm} \]

2. Perimeter = 28 cm
   
   \[ l = 7 \text{ cm}, \ w = 7 \text{ cm} \]
Relate Perimeter and Area

Use the grid below to draw rectangles for the given perimeter. Find the length and width of the rectangle with the greatest area. (Use whole numbers only.)

For the given area, find the length and width of the rectangle with the least perimeter. (Use whole numbers only.)

Mixed Review

10. What is the least common multiple of 15 and 10?

11. Change $\frac{1}{20}$ to a decimal.

12. $\frac{1}{3} + \frac{2}{5}$

13. Change 42 inches to feet.
Relate Perimeter and Area

Use the grid below to draw rectangles for the given perimeter. Find the length and width of the rectangle with the greatest area. (Use whole numbers only.) Check students’ drawings.

1. 50 cm
2. 34 cm
3. 12 cm

4. $l = 13\ cm, \ w = 12\ cm$
5. $l = 9\ cm, \ w = 8\ cm$
6. $l = 3\ cm, \ w = 3\ cm$

For the given area, find the length and width of the rectangle with the least perimeter. (Use whole numbers only.)

4. $30\ cm^2$
5. $12\ cm^2$
6. $21\ cm^2$

7. $l = 6\ cm, \ w = 5\ cm$
8. $l = 4\ cm, \ w = 3\ cm$
9. $l = 7\ cm, \ w = 3\ cm$

7. $50\ cm^2$
8. $4\ cm^2$
9. $48\ cm^2$

Mixed Review

10. What is the least common multiple of 15 and 10?

11. Change $\frac{1}{20}$ to a decimal.

12. $\frac{1}{3} + \frac{2}{5}$

13. Change 42 inches to feet.
Rectangle Challenge

There are 7 different rectangles with a perimeter of 28 feet and whole-number dimensions. Sketch and label each rectangle, and then list the perimeter and area of each.

<table>
<thead>
<tr>
<th>Sketch</th>
<th>Perimeter</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>28 ft</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>28 ft</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>28 ft</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>28 ft</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>28 ft</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>28 ft</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>28 ft</td>
<td></td>
</tr>
</tbody>
</table>

8. What is the average area of these rectangles? ________________
Rectangle Challenge

There are 7 different rectangles with a perimeter of 28 feet and whole-number dimensions. Sketch and label each rectangle, and then list the perimeter and area of each. Check students’ drawings.

<table>
<thead>
<tr>
<th>Sketch</th>
<th>Perimeter</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $1 \times 13$</td>
<td>28 ft</td>
<td>13 sq ft</td>
</tr>
<tr>
<td>2. $2 \times 12$</td>
<td>28 ft</td>
<td>24 sq ft</td>
</tr>
<tr>
<td>3. $3 \times 11$</td>
<td>28 ft</td>
<td>33 sq ft</td>
</tr>
<tr>
<td>4. $4 \times 10$</td>
<td>28 ft</td>
<td>40 sq ft</td>
</tr>
<tr>
<td>5. $5 \times 9$</td>
<td>28 ft</td>
<td>45 sq ft</td>
</tr>
<tr>
<td>6. $6 \times 8$</td>
<td>28 ft</td>
<td>48 sq ft</td>
</tr>
<tr>
<td>7. $7 \times 7$</td>
<td>28 ft</td>
<td>49 sq ft</td>
</tr>
</tbody>
</table>

8. What is the average area of these rectangles? 36 sq ft