

Name: ..... Class: .....

Rectangle: relationship between perimeter and area, word problems

a. The area of Mrs. Smith rectangular garden is 20 square feet. The perimeter of the garden is 24 feet. How wide and long is the garden?

b. The perimeter of a rectangular dressing room mirror is 28 feet. The area of the mirror is 48 square feet. How long and how wide is the mirror?

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## Rectangle: relationship between perimeter and area, word problems

- a. The area of Mrs. Smith rectangular garden is 20 square feet. The perimeter of the garden is 24 feet. How wide and long is the garden?

Let's try to think of two pairs of factors of 20 that will give us a product (area) of 20 square feet and a perimeter of 24 feet. Let's do this in a tabular form.

Measures	Area(feet <sup>2</sup> ) = length X width	Perimeter(feet) = sum of all side lengths
1 and 20	$1 \times 20 = 20$	$1 + 20 + 1 + 20 = 42$
2 and 10	$2 \times 10 = 20$	$2 + 10 + 2 + 10 = 24$
4 and 5	$4 \times 5 = 20$	$4 + 5 + 4 + 5 = 18$

You see that, a rectangle that is 2 feet by 10 feet has an area of 20 feet<sup>2</sup> and a perimeter of 24 feet.

So, the garden is 2 feet wide and 10 feet long.

- b. The perimeter of a rectangular dressing room mirror is 28 feet. The area of the mirror is 48 square feet. How long and how wide is the mirror?

Let's try to think of two pairs of factors of 48 that will give us a product (area) of 48 square feet and a perimeter of 28 feet. Let's do this in a tabular form.

Measures	Area(feet <sup>2</sup> ) = length X width	Perimeter(feet) = sum of all side lengths
1 and 48	$1 \times 48 = 48$	$1 + 48 + 1 + 48 = 90$
2 and 24	$2 \times 24 = 48$	$2 + 24 + 2 + 24 = 52$
3 and 16	$3 \times 16 = 48$	$3 + 16 + 3 + 16 = 38$
4 and 12	$4 \times 12 = 48$	$4 + 12 + 4 + 12 = 32$
6 and 8	$6 \times 8 = 48$	$6 + 8 + 6 + 8 = 28$

You see that, the rectangle that is 6 feet by 8 feet has an area of 48 square feet and a perimeter of 28 feet.

So, the rectangular mirror is 6 feet wide and 8 feet long.