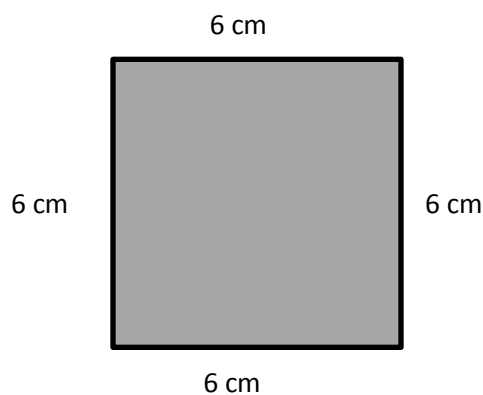


MATH 100 Geometric Figures: Rectangle Area and Perimeter

In this activity you will investigate “stretching” a square into rectangles. The square and rectangles in our example all have perimeters of 24 cm (centimeters). There are lots of other rectangles we could have used that also have perimeters of 24 cm, but we will work with just six rectangles. The same concepts we use in this activity apply to other squares and rectangles with identical perimeters.

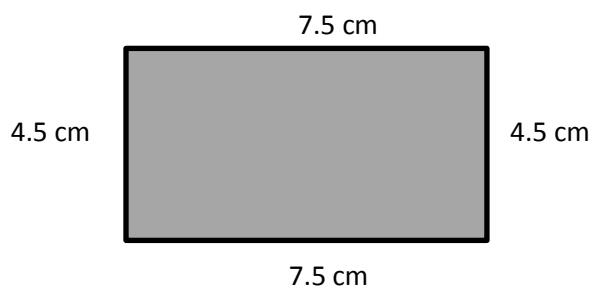
- 1.) What is a rectangle?
- 2.) Explain why a square is a rectangle.
- 3.) Explain, in words, how to calculate the perimeter of a rectangle.
- 4.) Write the formula for calculating the perimeter of a rectangle. Use L for length, W for width, and P for perimeter.
- 5.) Explain, in words, how to calculate the area of a rectangle.
- 6.) Write the formula for calculating the area of a rectangle. Use L for length, W for width, and A for area.

Let’s calculate the perimeters and areas of our rectangles. Each of the rectangles in our example has a perimeter of 24 cm. The perimeter and area calculations appear below each rectangle.



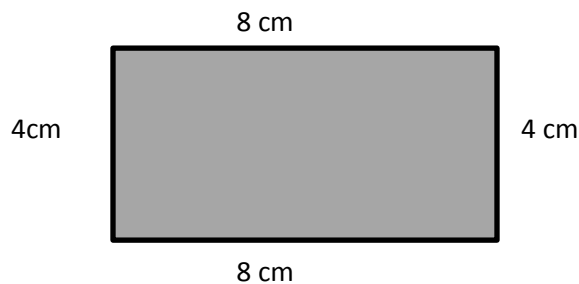
$$P = 2(6 \text{ cm}) + 2(6 \text{ cm}) = 12 \text{ cm} + 12 \text{ cm} = 24 \text{ cm}$$

$$A = (6 \text{ cm})(6 \text{ cm}) = 36 \text{ cm}^2$$



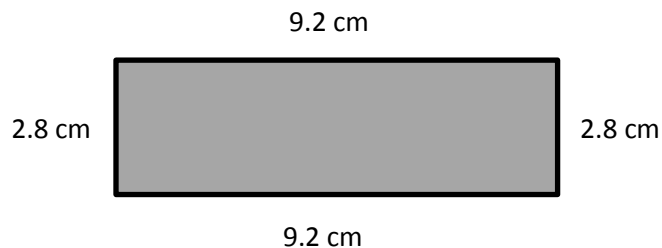
$$P = 2(7.5 \text{ cm}) + 2(4.5 \text{ cm}) = 15 \text{ cm} + 9 \text{ cm} = 24 \text{ cm}$$

$$A = (7.5 \text{ cm})(4.5 \text{ cm}) = 33.75 \text{ cm}^2$$



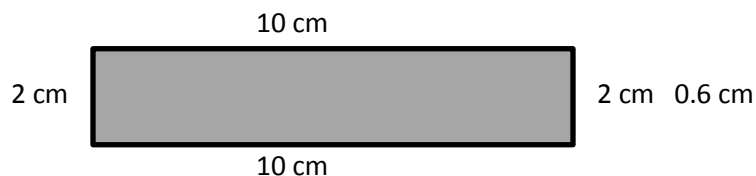
$$P = 2(8 \text{ cm}) + 2(4 \text{ cm}) = 16 \text{ cm} + 8 \text{ cm} = 24 \text{ cm}$$

$$A = (8 \text{ cm})(4 \text{ cm}) = 32 \text{ cm}^2$$



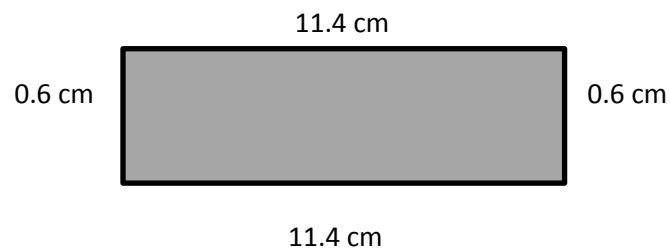
$$P = 2(9.2 \text{ cm}) + 2(2.8 \text{ cm}) = 18.4 \text{ cm} + 5.6 \text{ cm} = 24 \text{ cm}$$

$$A = (9.2 \text{ cm})(2.8 \text{ cm}) = 25.76 \text{ cm}^2$$



$$P = 2(10 \text{ cm}) + 2(2 \text{ cm}) = 20 \text{ cm} + 4 \text{ cm} = 24 \text{ cm}$$

$$A = (10 \text{ cm})(2 \text{ cm}) = 20 \text{ cm}^2$$



$$P = 2(11.4 \text{ cm}) + 2(0.6 \text{ cm}) = 22.8 \text{ cm} + 1.2 \text{ cm} = 24 \text{ cm}$$

$$A = (11.4 \text{ cm})(0.6 \text{ cm}) = 6.84 \text{ cm}^2$$

7.) Calculate the perimeter and area of each of our example rectangles. Show how you calculated each using the example calculations for the rectangle with a length of 6 cm and a width of 6 cm.

length L in cm	width W in cm	perimeter P in cm	area A in cm ²
6	6	$2(6) + 2(6) = 24$	$(6)(6) = 36$
7.5	4.5		
8	4		
9.2	2.8		
10	2		
11.4	0.6		

8.) As the rectangle “stretches” the length L increases and the width W decreases, but the perimeters in our example are all 24 cm. How does the area change as our rectangles stretch?

9.) For which side lengths is the area of the rectangle the largest? What shape is that rectangle?