**Perimeter and Area**

**Perimeter**

*l*

*w*

The **perimeter** of a shape is the **total length of its sides**.

Perimeter of this rectangle ***P* = *l* + *w* + *l* + *w***

This can also be written as ***P* = 2*l* + 2*w*** or ***P* = 2(*l* + *w*)**

**Area**

**Area** measures the **surface** of something.

**Area of a rectangle = length  width**

For the rectangle shown, the area ***A* = *lw***

Sometimes you may need to find other algebraic expressions for perimeters and areas.

3*x*

2*x*

***Examples***

Perimeter = 3*x* + 2*x* + 3*x* + 2*x* = 10*x*

Area = 3*x* × 2*x =* 6*x*2

4*a*

2*b*

Perimeter = 4*a* + 2*b* + 4*a* + 2*b* = 8*a* + 4*b*

Area = 4*a* × 2*b =* 8*ab*

*x* + 5

*x* – 1

Perimeter = *x* + 5 + *x* – 1 + *x* + 5 + *x* – 1= 4*x* + 8

Area = (*x* + 5)(*x* – 1) *=* *x*2 – *x* + 5*x* – 5 = *x*2 + 4*x* – 5

3*y*

5*y*

4*x*

3*x*

2*y*

*x*

#### B

#### A

Perimeter = 4*x* + 3*y* + *x* + 2*y* + 3*x* + 5*y*

= 8*x* + 10*y*

Area of A = 4*x* × 3*y =* 12*xy*

Area of B = 3*x* × 2*y =* 6*xy*

Total area = 12*xy* + 6*xy* = 18*xy*

Perimeter and Area Questions

1. Find algebraic expressions for the perimeter and area of each rectangle.

c)

4*y*

5*x*

5*x*

3*x*

a)

3*a*

4*a*

b)

2. Find algebraic expressions for the perimeter and area of these rectangles.

*y*

2*y* – 1

b)

*x* + 3

*x* – 1

c)

*x* + 7

*x*

a)

d)

f)

2*a* – *b*

3*a* – *b*

*x* + *y*

*x* – *y*

e)

2*a*

*a* + 1

3 Find algebraic expressions for the perimeter and area of these shapes.

c)

*x*

*x*

2*x* +1

2*x* + 3

2*x*

3*a*

5*a*

3*a*

3*a*

3*a*

b)

a)

4*y*

2*x*

6*x*

3*y*

Create your own perimeter and area problems. One of them should be as above. The other is to be a word problem. Exchange it with a person in your group and see if they can solve it.