

**Example: Perimeter and Area of a Kite****Problem:**

Find the perimeter and area of kite ABCD, given that segment AX equals 10, segment XC equals 20 and segment DB equals 18.

**Solution:**

If we are going to find the perimeter, we need to know the side lengths. Since this is a kite, we know that side AB is congruent to side AD, and that side BC is congruent to side DC.

Let's first find the length of AB. We can find this using the right triangle AXB. We already know that segment AX equals 10.

We know that XB is half of diagonal DB, so segment XB equals 9.

We can now use the Pythagorean Theorem to find the length of AB. AX squared plus XB squared equals AB squared.

$10^2 + 9^2 = AB^2$

Solve this for AB to get that AB equals 13.45.

We can now use right triangle BXC and the same process to find the length of side BC. Segment XC equals 20 and segment XB equals 9.

We can now use the Pythagorean Theorem to find the length of BC. XB squared plus XC squared equals BC squared.

$9^2 + 20^2 = BC^2$

Solve this for BC to get that BC equals 21.93.

Now that we have the side lengths, we can find the perimeter of this kite.

The perimeter is equal to the sum of 2 times side AB plus 2 times side BC.

Simplify this to get 70.76.

The perimeter is 70.76 units.

The last thing we are asked to find is the area. To calculate this, we need to know the length of both diagonals.

Diagonal AC is equal to segment AX plus segment XC.

$AC = 10 + 20 = 30$

To find the area, we find one-half of the product of AC times DB.

The area is one-half of the product of 30 times 18, which equals 270.

The area is 270 square units.