1) One diagonal and each side of a rhombus measure 8 meters. What is the area of the rhombus?
2) The area of a polygon is 450 square units, and one of its sides measures 36 units. The area of a similar polygon is 300 square units. What is the length of the side corresponding to the 36-unit side in the other polygon?

Solution

1) Since the two sides and the diagonal of the rhombus are equal they form an equilateral triangle with side $a = 8$ meters. That's why the area of the rhombus S_{rh} is equal to 2 areas of an equilateral triangle S_{et}

$$S_{rh} = 2S_{et}, \qquad S_{et} = \frac{\sqrt{3}}{4}a^2, \qquad S_{rh} = \frac{\sqrt{3}}{2}a^2 = \frac{\sqrt{3}}{2}8^2 = \sqrt{3}*32 \approx 55.4\,m^2$$

2) The area of a polygon is 450 square units and one of its sides measures 36 units; the area of a similar polygon is 300 square units. The ratio of areas is 300 to 450 is 2 to 3. The ratio of the areas of the two polygons is the square of the ratio of the sides. Therefore the corresponding side length for the 36 unit side on the similar polygon is $36 * \sqrt{\frac{2}{3}} \approx 29.4$ units.

Answer: 1) $55.4\,m^2$; 2) 29.4 units.