A wire of length 400 m is stretched tight between two points of the horizontal plane. Then a length 2 cm is added to the wire, and it is stretched again by lifting the middle point. How large is the space between the wire and the plane near the middle?

Will a cat be able to pass through the gap?

Try to answer before you look at the solution on the next page.

Let h be the height of the gap in the middle. Pythagoras theorem gives

$$\sqrt{200^2 + h^2} = 200 + 0.01,$$

Solving this we obtain

$$h^2 \approx \sqrt{2 \times 200 \times 0.01} \approx 2,$$

so the gap is 2 meters, and an average horse can pass.