Find the equation of the parabola having vertex $(0,0)$, axis along the x-axis and passing through $(2,-1)$.

Solution:

The curve must have horizontal orientation, since we know it along the x-axis.

So we need to use the general formula

$$y^2 = 4px$$

We need to find p. We know the curve goes through $(2,-1)$, so we substitute:

$$(-1)^2 = 4(p)(2)$$

$$1 = 8p$$

$$p = \frac{1}{8}$$

So the required equation is

$$y^2 = \frac{x}{2}$$

Answer: $y^2 = \frac{x}{2}$