

The equation of a line is. What will the slope be for a line that is perpendicular to this line?

### **Solution**

Let's consider a typical line equation (equation in slope-intercept form):

$$y = kx + b$$

The slope of this equation is  $k$ .

As it's known,

$$k = \operatorname{tg}(\varphi)$$

where  $\varphi$  is an angle between positive direction of the x-axis and our line.

The line which is perpendicular to ours has an angle with positive direction of the x-axis, which is equal to  $\varphi + 90^\circ$ .

So,

$$\operatorname{tg}(\varphi + 90^\circ) = -\operatorname{ctg}(\varphi) = -\frac{1}{\operatorname{tg}(\varphi)} = -\frac{1}{k}$$

### **Answer**

For a line with equation

$$y = kx + b$$

the slope of its perpendicular is equal to  $-\frac{1}{k}$