

**Linear function - CKE exercises**  
**Basic level**

*Words you may not know:*

- *slope of a line* - współczynnik kierunkowy prostej
- *slope-intercept form* - postać kierunkowa funkcji liniowej
- *parallel* - równoległy
- *perpendicular* - prostopadły

**Ex. 1.** The line  $y = -2x + (3m + 3)$  intersects the  $y$ -axis at the point  $A(0,2)$ . Find  $m$ .

**Ex. 2.** For which value of  $m$  is a linear function  $f(x) = (m - 1)x + 6$  increasing?

**Ex. 3.** A linear function is given by a formula  $f(x) = -\sqrt{2}x + 4$ . Find the zero of the function.

**Ex. 4.** The line  $k$  is given by the equation  $k: y = 2x - 3$ . Find the equation of a line  $l$ , which is parallel to the line  $k$  and goes through the point  $P(-2,1)$ .

**Ex. 5.** The points  $A(-2,2)$  and  $B(4,-2)$  belong to the line  $y = ax + b$ . Find the value of its slope  $a$ .

**Ex. 6.** Point  $A(0,5)$  belongs to a line  $k$ , which is perpendicular to the line  $y = x + 1$ . Find the formula of the line  $k$ .

**Ex. 7.** Convert the standard equation  $3x - 6y + 7 = 0$  to the slope-intercept form.

**Ex. 8.** The number  $-2$  is a zero of a function  $f(x) = mx + 2$ . Find  $m$ .

**Ex. 9.** Find a formula of a straight line which is perpendicular to the line  $f(x) = -\frac{1}{3}x + 2$  and intersects the coordinate system at the origin.

**Ex. 10.** The point  $A(0,1)$  belongs to the graph of a function  $f(x) = (m - 2)x + (m - 3)$ . Find  $m$ .

**Ex. 11.** A line  $y = \frac{2}{m}x + 1$  is perpendicular to the line  $y = -\frac{3}{2}x - 1$ . Find  $m$ .

**Ex. 12.** A line  $l$  is given by the formula  $y = -\frac{2}{5}x$ . A line  $k$  is parallel to the line  $l$  and intersects the  $y$ -axis at the point  $A(0,3)$ . Find the equation of the line  $k$ .

**Ex. 13.** We know that the point  $P(-2,3)$  belongs to the graph of a linear function  $f$ , besides  $f(1) = 2$ . Find the formula of a function  $f$ .

**Ex. 14.** Two points  $K(1,0)$  and  $L(0,1)$  belong to a line  $y = ax + b$ . Find  $a$  and  $b$ .

**Ex. 15.** For which value of  $m$  are straight lines  $y = mx - 5$  and  $y = (1 - 2m)x + 7$  parallel?

**Ex. 16.** A linear function  $f(x) = 2x + b$  has the same zero as the linear function  $g(x) = -3x + 4$ . Find  $b$ .

**Ex. 17.** A line  $y = m^2x + 3$  is parallel to a line  $y = (4m - 4)x - 3$ . Find  $m$ .

**Ex. 18.** For which values of  $m$  are lines  $y = 2mx - m^2 - 1$  and  $y = 4mx + m^2 + 1$  perpendicular?

**Ex. 19.** The lines  $2x - 3y = 4$  and  $5x - 6y = 7$  intersect at a point  $P$ . Find coordinates of the point  $P$ .

**Ex. 20.** A linear function is given by the formula  $f(x) = (a + 1)x + 11$ . The zero of this function equals  $x = \frac{3}{4}$ . Find  $a$ .