

Linear function - graph of a linear function (1)

Exercise 1.

Among the functions defined by the formulas below, there are linear functions. Identify them.

a) $f(x) = -2x$

c) $f(x) = \frac{1}{2}x^2$

b) $f(x) = \frac{5}{x} + 7$

d) $f(x) = 5 - \frac{x}{4}$

$f(x) = ax + b$ formula of a linear function

a, b - constants

* a constant denotes a fixed real number

a - slope (slope coefficient)

b - constant term

a) $f(x) = -2x$ this is a linear function

constant term $b = 0$

b) $f(x) = \frac{5}{x} + 7$ this is not a linear function

this is a rational function

c) $f(x) = \frac{1}{2}x^2$ this is not a linear function

this is a quadratic function

d) $f(x) = 5 - \frac{x}{4}$ this is a linear function

Linear function - graph of a linear function (2)

Exercise 2.

Indicate the point where the graph of the function $f(x) = -2x + 5$ intersects the y-axis.

- A. $(0, -5)$ B. $(0, -2)$ C. $(0, 2)$ D. $(0, 5)$.

$$f(x) = ax + b$$

- the constant term b determines the point where the graph of a linear function intersects the y-axis

- this point is $(0, b)$

for $f(x) = -2x + 5$ this point is $(0, 5) \rightarrow$ answer D.

Is that clear? :)

Linear function - graph of a linear function (3)

Exercise 3.

Indicate the zero of the function $f(x) = 12x + 3$.

A. -3

B. $-\frac{1}{4}$

C. $\frac{1}{4}$

D. 3

$$y = ax + b$$

- the zero is the point where the graph of a linear function intersects the x-axis

- this point is $(x, 0)$

- if $a \neq 0$, then $x = -\frac{b}{a}$

$$\text{for } f(x) = 12x + 3 \quad x = -\frac{b}{a} = -\frac{3}{12} = -\frac{1}{4} \rightarrow \text{answer B.}$$

Is that clear? :)