

Identifying Linear vs. Nonlinear Functions

1 Which of the followings is a linear equation?

A. $y = \frac{5}{x}$

B. $y = -5x + 3$

C. $y = x^2 + 3x - 5$

D. $y = \sqrt{2x + 4}$

2 Which of the followings is a linear equation?

A. $y = -\frac{3}{x}$

B. $y = x - 1$

C. $y = 2x^2 + 4x - 5$

D. $y = \sqrt{x} + 3$

3 Which of the following equations is a linear equation?

A. $y = 7x^2$

B. $y = 5x + 7$

C. $y = 2x + 3z^3$

D. $y = \frac{8}{x}$

4 How many of the following functions are linear functions?

(1) $y = 2x$;

(2) $y = \frac{x}{2}$;

(3) $y = 2x + 1$;

(4) $y = 2x^2 + 1$

A. 4

B. 3

C. 2

D. 1

5 Among the following equations:

(1) $y = 3x$;

(2) $y = 2x - 1$;

(3) $y = \frac{1}{x}$;

(4) $y = x^2 - 1$;

(5) $y = \frac{x}{8}$,

how many of them is(are) linear equation(s)?

A. 4

B. 3

C. 2

D. 1

6 Which of the following statements is correct?

A. $y = mx + c$ is a linear function.

B. A linear function is not a direct proportional function.

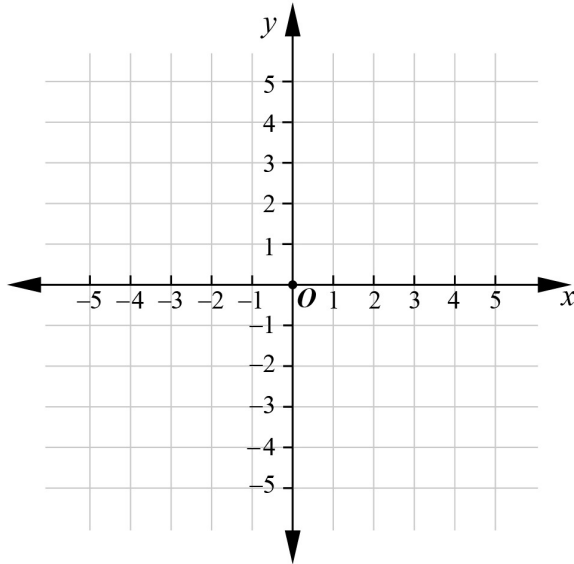
C. A direct proportional function is also a linear function.

D. If a function is not a direct proportional function, then it is also not a linear function.

7 Rearrange the equation in function form, then graph the equation.

$$-2y + 4x = 2x + 8$$

$$y = \underline{\hspace{2cm}}.$$



8 Complete the table below such that the pair of x and y is a solution of the equation $y = x + 3$.

x	-2	0	2
y	$\underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$

9 Consider the equation $2x + y = 3$.

(1) Make y the subject of the equation.

$$y = \underline{\hspace{2cm}}$$

(2) Complete the following table.

x	0	1	2
y	<u> </u>	<u> </u>	<u> </u>

10 Consider the equation $x + y = -1$.

(1) Make y the subject of the equation.

$$y = \underline{\hspace{2cm}}$$

(2) Hence, complete the following table.

x	<u> </u>	0	1
y	0	<u> </u>	<u> </u>

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C. $y = x^2 + 3x - 5$

D. $y = \sqrt{2x + 4}$

Answer B

Solution A linear function's general form is: $y = mx + b$

The answer is B.

2 Which of the followings is a linear equation?

A. $y = -\frac{3}{x}$

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The answer is B.

4 How many of the following functions are linear functions?

(1) $y = 2x$;

(2) $y = \frac{x}{2}$;

(3) $y = 2x + 1$;

(4) $y = 2x^2 + 1$

A. 4

B. 3

C. 2

D. 1

Answer B

Solution Only (4) is not a linear function, because the exponent of x is not 1.

The answer is B.

5 Among the following equations:

(1) $y = 3x$;

(2) $y = 2x - 1$;

(3) $y = \frac{1}{x}$;

(4) $y = x^2 - 1$;

(5) $y = \frac{x}{8}$;

how many of them is(are) linear equation(s)?

A. 4

B. 3

C. 2

D. 1

Answer B

Solution (1), (2), and (5) are linear equations.

The answer is B.

6 Which of the following statements is correct?

A. $y = mx + c$ is a linear function.

B. A linear function is not a direct proportional function.

C. A direct proportional function is also a linear function.

D. If a function is not a direct proportional function, then it is also not a linear function.

Answer C

Solution A is incorrect because m need to be not equal to 0.

B is incorrect because a linear function could be a direct proportional function if $c = 0$.

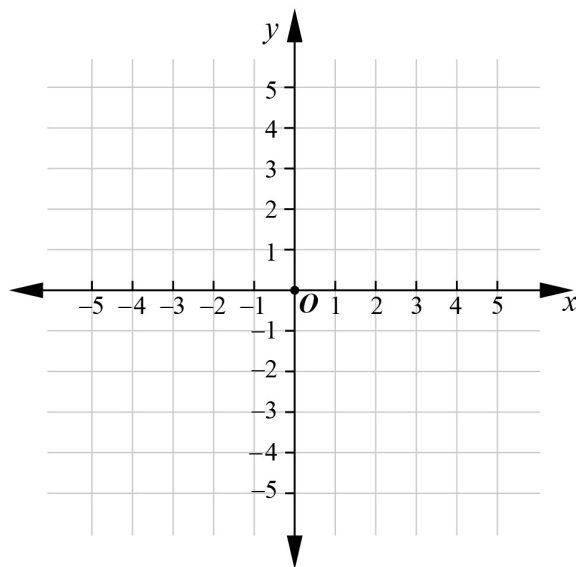
D, for example, $y = x + 1$ is not a direct proportional function, but it is a linear equation.

The answer is C.

7 Rearrange the equation in function form, then graph the equation.

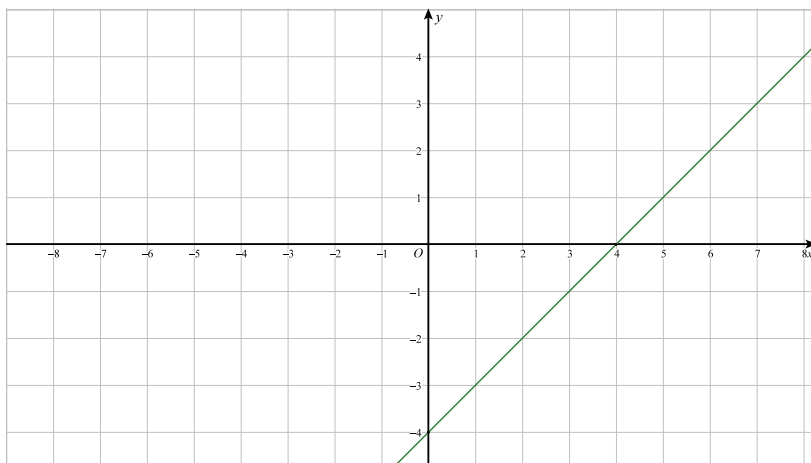
$$-2y + 4x = 2x + 8$$

$$y = \underline{\hspace{2cm}}.$$



Answer $x - 4$

Solution



- 8 Complete the table below such that the pair of x and y is a solution of the equation $y = x + 3$.

x	-2	0	2
y	_____	_____	_____

Answer 1:1

2:3

3:5

Solution

x	-2	0	2
y	1	3	5

- 9 Consider the equation $2x + y = 3$.

(1) Make y the subject of the equation.

$$y = \underline{\hspace{2cm}}$$

(2) Complete the following table.

x	0	1	2
y	_____	_____	_____

Answer (1) $-2x + 3$

Alternative: $3 - 2x$

(2) $1:3$

$2:1$

$3:-1$

Solution (1) $2x + y = 3$

$y = -2x + 3$

(2)

x	0	1	2
y	3	1	-1

10 Consider the equation $x + y = -1$.

(1) Make y the subject of the equation.

$y = \underline{\hspace{2cm}}$

(2) Hence, complete the following table.

x	$\underline{\hspace{2cm}}$	0	1
y	0	$\underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$

Answer (1) $-x - 1$

Alternative: $-1 - x$

(2) $1:-1$

$2:-1$

$3:-2$

Solution (1) $x + y = -1$

$y = -x - 1$

(2)

x	-1	0	1
y	0	-1	-2