

Algebra 1 - Graphing Linear Equations - Answer Key

Common Core A-REI.D.10, F-IF.C.7a, A-CED.A.2 · maths-pdf.fr/en/

Use this key to check your work on the graphing linear equations worksheet. Every solution shows the steps, and the final answer appears in bold. If your answer differs, find the first line where your work and the key disagree, then redo the problem from there without looking.

Algebra 1 · Common Core State Standards: **A-REI.D.10, F-IF.C.7a, A-CED.A.2**

Exercise 1 - Slope and intercept

In $y = mx + b$, $m = 3$ and $b = -5$.

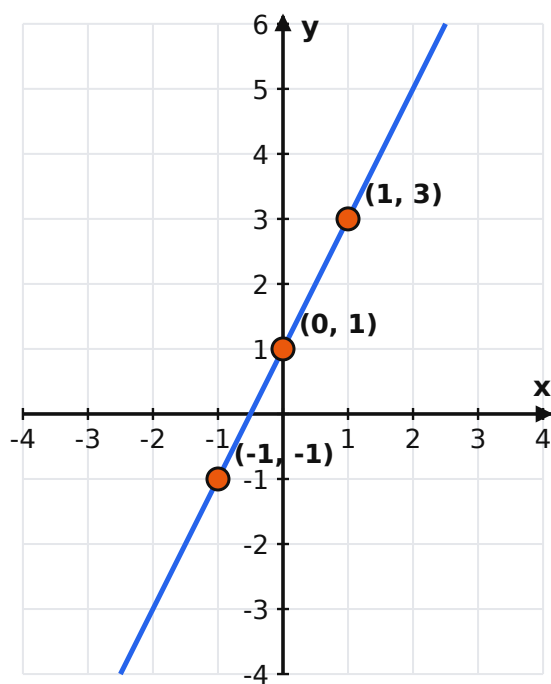
Slope 3; y-intercept $(0, -5)$

Exercise 2 - Fraction slope

Compare with $y = mx + b$.

Slope $-\frac{3}{4}$; y-intercept $(0, 5)$

Exercise 3 - Graph $y = 2x + 1$

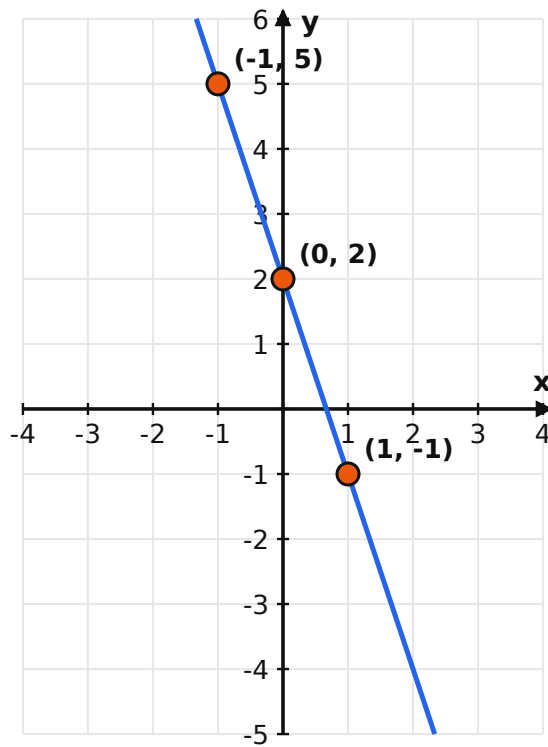


Graph of the line.

Plot the y-intercept $(0,1)$. Slope $2 = \frac{2}{1}$: up 2, right 1 to $(1,3)$. Check $(-1,-1)$.

Line through $(0, 1)$ and $(1, 3)$

Exercise 4 - Negative slope

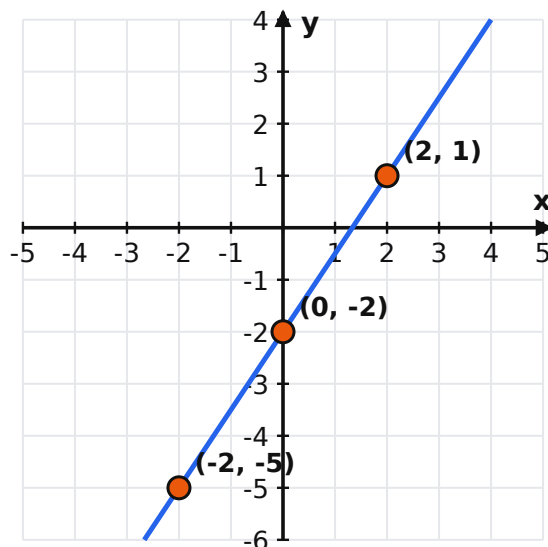


Graph of the line.

Plot $(0, 2)$. Slope $-3 = \frac{-3}{1}$: down 3, right 1 to $(1, -1)$.

Line through $(0, 2)$ and $(1, -1)$

Exercise 5 - Fraction slope graph



Graph of the line.

Plot $(0, -2)$. Rise 3, run 2: $(2, 1)$. Go left 2 and down 3 for $(-2, -5)$.

Line through $(0, -2)$ and $(2, 1)$

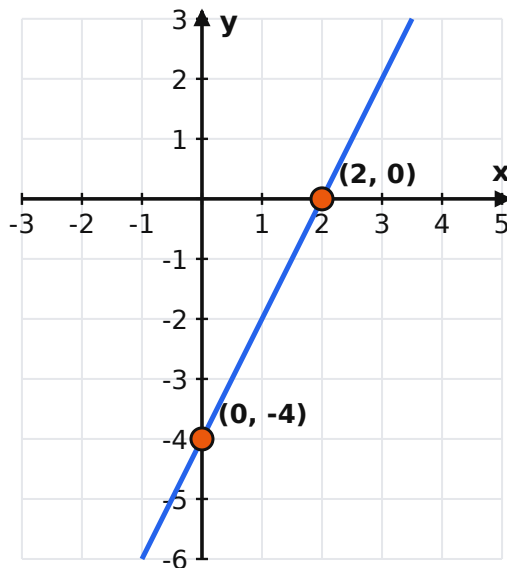
Exercise 6 - Intercepts

Let $y=0$: $3x=12$, so $x=4$.

Let $x=0$: $4y=12$, so $y=3$.

x-intercept $(4, 0)$; y-intercept $(0, 3)$

Exercise 7 - Graph with intercepts



Graph of $2x - y = 4$.

Let $y=0$: $2x=4$, so $x=2$. Let $x=0$: $-y=4$, so $y=-4$.

Line through $(2, 0)$ and $(0, -4)$

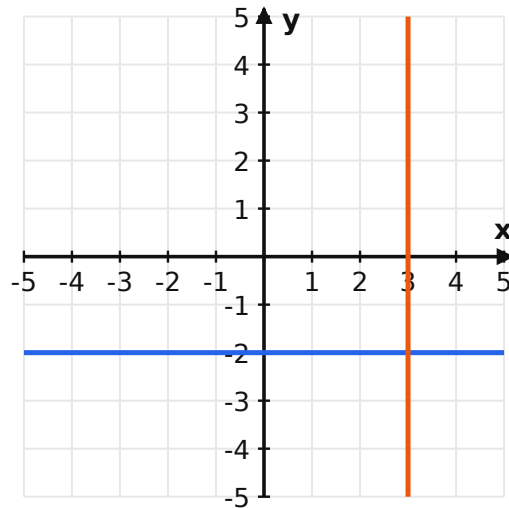
Exercise 8 - Standard to slope-intercept

Subtract $6x$: $3y = -6x + 9$.

Divide every term by 3.

$$y = -2x + 3$$

Exercise 9 - Horizontal and vertical



Two lines.

$y = -2$ is horizontal through $(0, -2)$. $x = 3$ is vertical through $(3, 0)$.

Horizontal line through -2; vertical line through 3

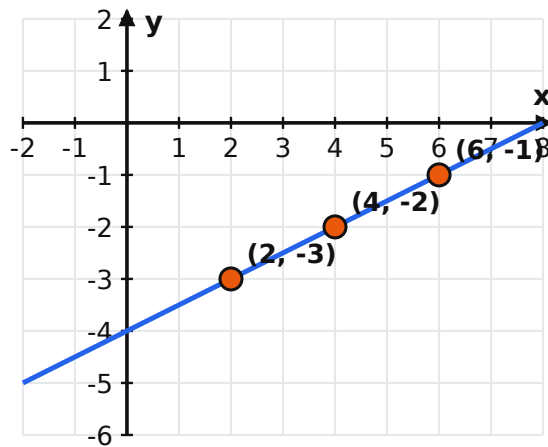
Exercise 10 - Point-slope form

Point-slope: $y - 1 = 2(x - 3)$.

Distribute: $y - 1 = 2x - 6$. Add 1: $y = 2x - 5$.

$$y - 1 = 2(x - 3); y = 2x - 5$$

Exercise 11 - Graph point-slope



Graph of the line.

The equation is $y - (-2) = \frac{1}{2}(x - 4)$, so the line passes through $(4, -2)$ with slope $\frac{1}{2}$. Go right 2 and up 1 to $(6, -1)$.

Line through $(4, -2)$ and $(6, -1)$

Exercise 12 - Is the point on the line?

(a) $2(3)+1=7$, which equals y . (b) $2(-1)+1=-1$, which is not 4.

(a) yes; (b) no

Exercise 13 - Match the graph

The y-intercept is 4, an entry fee. From $(0,4)$ to $(1,7)$, the cost rises \$3 for each hour.

$y = 3x + 4$; **\$3 per hour**

Exercise 14 - Complete a table

$-(-2)+5=7$, $-0+5=5$, $-3+5=2$.

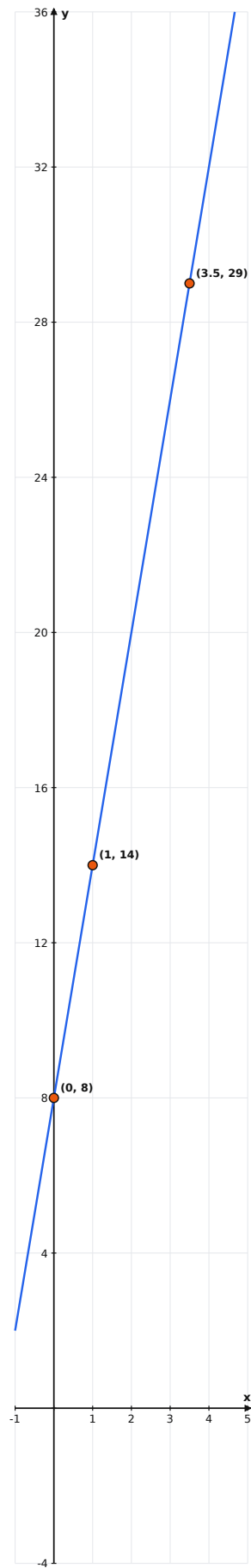
$(-2, 7)$, $(0, 5)$, $(3, 2)$

Exercise 15 - Compare steepness

Line A has slope 3. Line B has slope $\frac{12-4}{2-0} = 4$.

Line B is steeper (slope $4 > 3$)

Exercise 16 - Bike rental



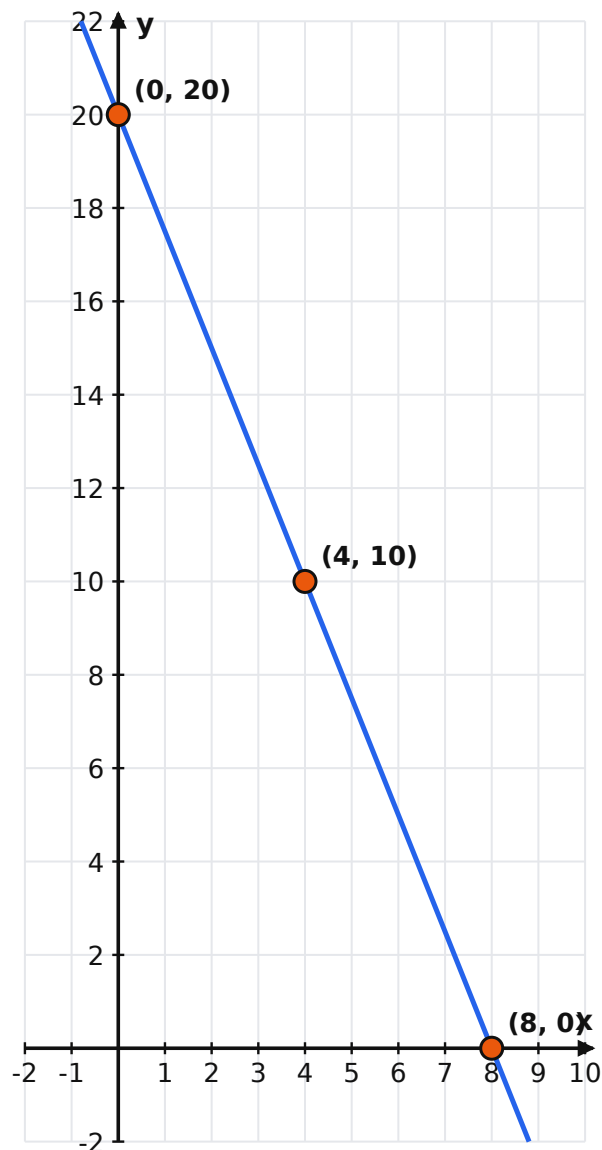
Cost of renting a bike.

The slope 6 is the cost per hour; the intercept 8 is the fee.

$$6(3.5) + 8 = 21 + 8 = 29.$$

\$6 per hour; \$8 fee; \$29

Exercise 17 - Fundraiser tickets



Ways to reach \$40.

Let $y = 0$: $5x = 40$, so $x = 8$: 8 adult tickets and no student tickets.

Let $x=0$: $2y=40$, so $y=20$.

For $x=4$: $20+2y=40$, so $y=10$.

(8, 0) and (0, 20); $y = 10$

Exercise 18 - Draining tank

y-intercept: $x=0$ gives $y=60$ (the tank starts full). x-intercept: $0=60-3x$ gives $x=20$ (the tank is empty after 20 minutes).

Domain: $0 \leq x \leq 20$.

(0, 60), (20, 0); 0 to 20 minutes

Exercise 19 - Moving company

$25(4)+50=150$.

Solve $25x+50=225$: $25x=175$, so $x=7$.

\$150; 7 hours

Exercise 20 - Temperature graph

Slope $\frac{9}{5}=1.8$: each 1°C adds 1.8°F . Intercept 32: water freezes at 32°F .

$F = \frac{9}{5}(100)+32=180+32=212$.

212°F

Exercise 21 - Equation from two points

Slope: $\frac{-2-4}{4-(-2)} = \frac{-6}{6} = -1$.

Use $(4,-2)$: $-2=-1(4)+b$, so $b=2$.

$y=-x+2$