

Algebra 1 - Writing Linear Equations and Functions - Answer Key

Common Core F-LE.A.2, F-BF.A.1a, A-CED.A.2 · maths-pdf.fr/en/

Here are full solutions for the writing linear equations worksheet. Read each step, not just the bold answer, and compare it with your own method. Redo any problem you missed, and note which kind of mistake you made so you can avoid it on the test.

Algebra 1 · Common Core State Standards: **F-LE.A.2, F-BF.A.1a, A-CED.A.2**

Exercise 1 - Slope and intercept given

Substitute $m = 4$ and $b = -3$ into $y = mx + b$.

$$y = 4x - 3$$

Exercise 2 - Slope and y-intercept point

The point is on the y-axis, so $b = 5$.

$$y = -2x + 5$$

Exercise 3 - Equation from a graph

The y-intercept is 1. Slope: $\frac{5-1}{2-0} = 2$.

$$y = 2x + 1$$

Exercise 4 - Point and slope

Point-slope: $y - 4 = 3(x - 2)$.

Distribute: $y - 4 = 3x - 6$. Add 4: $y = 3x - 2$.

$$y - 4 = 3(x - 2); y = 3x - 2$$

Exercise 5 - Fraction slope

Substitute into $y = mx + b$: $1 = -\frac{1}{2}(4) + b$, so $1 = -2 + b$.

$$b = 3.$$

$$y = -\frac{1}{2}x + 3$$

Exercise 6 - Two points, positive slope

$$\text{Slope: } \frac{9-5}{4-2} = 2.$$

Substitute (2,5): $5 = 2(2) + b$, so $b = 1$.

$$y = 2x + 1$$

Exercise 7 - Two points

$$\text{Slope: } \frac{-5-7}{4-(-2)} = \frac{-12}{6} = -2.$$

Substitute $(-2,7)$: $7 = -2(-2) + b$, so $7 = 4 + b$ and $b = 3$.

$$y = -2x + 3$$

Exercise 8 - Equation from a table

The outputs rise by 3 for each step of 1, so $m = 3$.

Substitute (1,7): $7 = 3(1) + b$, so $b = 4$.

$$y = 3x + 4$$

Exercise 9 - Table with steps of 2

As x increases by 2, y decreases by 4, so the slope is $\frac{-4}{2} = -2$.

Substitute (2,1): $1 = -2(2) + b$, so $b = 5$.

$$y = -2x + 5$$

Exercise 10 - Parallel line

Parallel lines share the slope 2. Substitute $(3,-1)$: $-1 = 2(3) + b$, so $b = -7$.

$$y = 2x - 7$$

Exercise 11 - Perpendicular line

The perpendicular slope is the negative reciprocal of 2, which is $-\frac{1}{2}$.

Substitute (4,3): $3 = -\frac{1}{2}(4) + b$, so $b = 5$.

$$y = -\frac{1}{2}x + 5$$

Exercise 12 - Horizontal and vertical

The horizontal line has the constant y-value 2. The vertical line has the constant x-value -3.

$$y = 2 \text{ and } x = -3$$

Exercise 13 - Standard form

Multiply every term by 4: $4y = 3x - 8$.

Subtract $4y$ from both sides and add 8: $8 = 3x - 4y$.

$$3x - 4y = 8$$

Exercise 14 - Function notation

The y-intercept is -4 . Slope: $\frac{5 - (-4)}{3 - 0} = 3$.

$$f(x) = 3x - 4$$

Exercise 15 - Do three points line up?

Slope of the first pair: $\frac{8-2}{3-1} = 3$. Second pair: $\frac{14-8}{5-3} = 3$. The slopes match.

Substitute (1,2): $b = 2 - 3 = -1$.

Yes; $y = 3x - 1$

Exercise 16 - Cell plan

Total

\$20 monthly fee

\$0.05 per text

Cost = fee + rate $\times$ texts.

$$C(x) = 0.05x + 20.$$

$$C(300) = 0.05(300) + 20 = 15 + 20 = 35.$$

$$C(x) = 0.05x + 20; \text{ \$35}$$

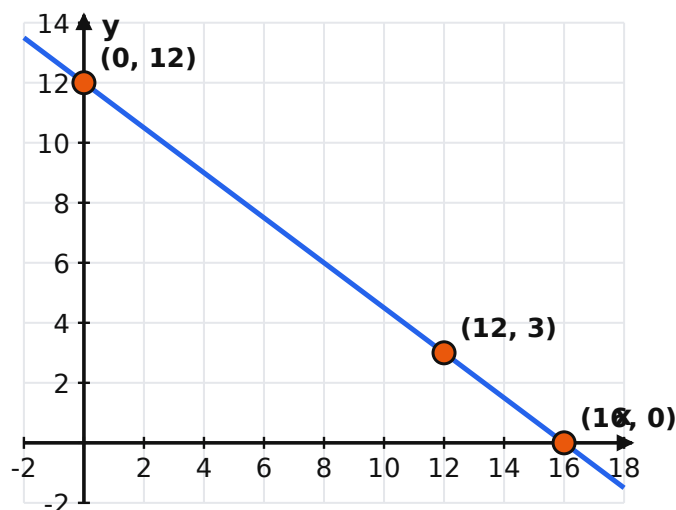
Exercise 17 - Plumber

The charge rises \$60 per hour, so $m = 60$. Then $105 = 60(1) + b$ gives $b = 45$.

$$C = 60h + 45. \text{ For 2.5 hours: } 60(2.5) + 45 = 195.$$

$$C = 60h + 45; \text{ \$195}$$

Exercise 18 - Candle



Height of the candle.

$$H = 12 - 0.75t.$$

Solve $12 - 0.75t = 3$: $0.75t = 9$, so $t = 12$. Burn out: $12 - 0.75t = 0$, so $t = 16$.

$$H = 12 - 0.75t; \text{ 12 hours; 16 hours}$$

Exercise 19 - Car rental

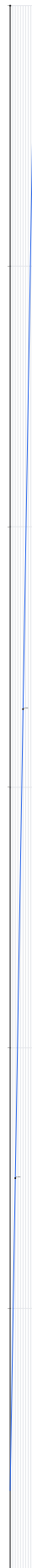
Rate: $\frac{205-135}{5-3} = 35$ dollars per day.

Substitute (3,135): $135 = 35(3) + b$, so $b = 30$.

$C = 35d + 30$. For 7 days: $35(7) + 30 = 275$.

$C = 35d + 30$; **\$275**

Exercise 20 - Filling a pool



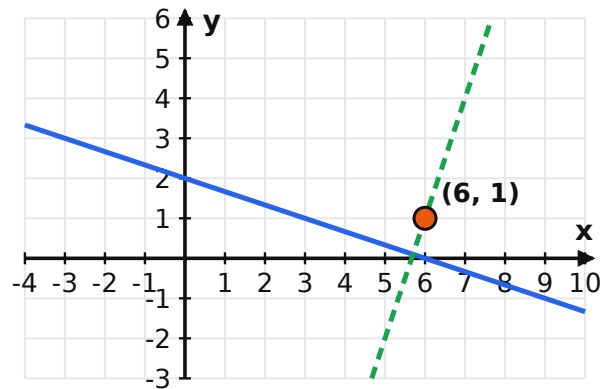
Gallons in the pool.

Rate: $\frac{330-150}{5-2} = 60$ gallons per hour. Substitute: $150 = 60(2) + b$, so $b = 30$.

$G = 60h + 30$. For 8 hours: $60(8) + 30 = 510$.

$G = 60h + 30$; **510 gallons**

Exercise 21 - Perpendicular road



The new road (dashed) is perpendicular.

The perpendicular slope is the negative reciprocal of $-\frac{1}{3}$, which is 3.

Substitute $(6,1)$: $1 = 3(6) + b$, so $b = -17$.

$$y = 3x - 17$$