

Grade 8 - Linear Functions as Models - Worksheet

Common Core 8.F.B.4, 8.F.B.5 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice linear functions as models, rate of change, initial value and graph descriptions (Common Core 8.F.B.4 and 8.F.B.5). Each problem has its own space for work, so print the page and write directly on it.

The problems start with direct skill checks and grow harder as you go. Later items build and interpret models and describe graphs of real situations. Use the answer key afterwards to check every step.

Grade 8 · Common Core State Standards: **8.F.B.4, 8.F.B.5**

Exercise 1 - Rate from a table

x	1	3
y	5	11

Find the rate of change from the table.

Exercise 2 - Initial value

x	0	2	4
y	7	13	19

Find the rate of change and initial value, then write the equation.

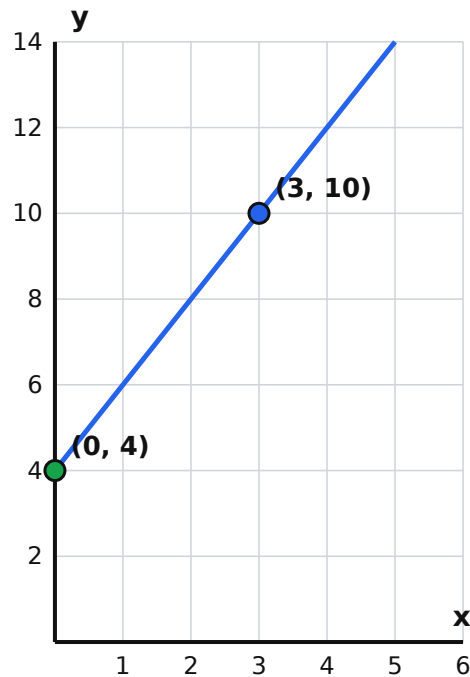
Exercise 3 - Interpret an equation

A gym membership costs $y = 4x + 12$ dollars for x visits. Explain what 4 and 12 mean.

Exercise 4 - Two points

A line passes through (2,11) and (5,20). Write its equation.

Exercise 5 - Equation from a graph



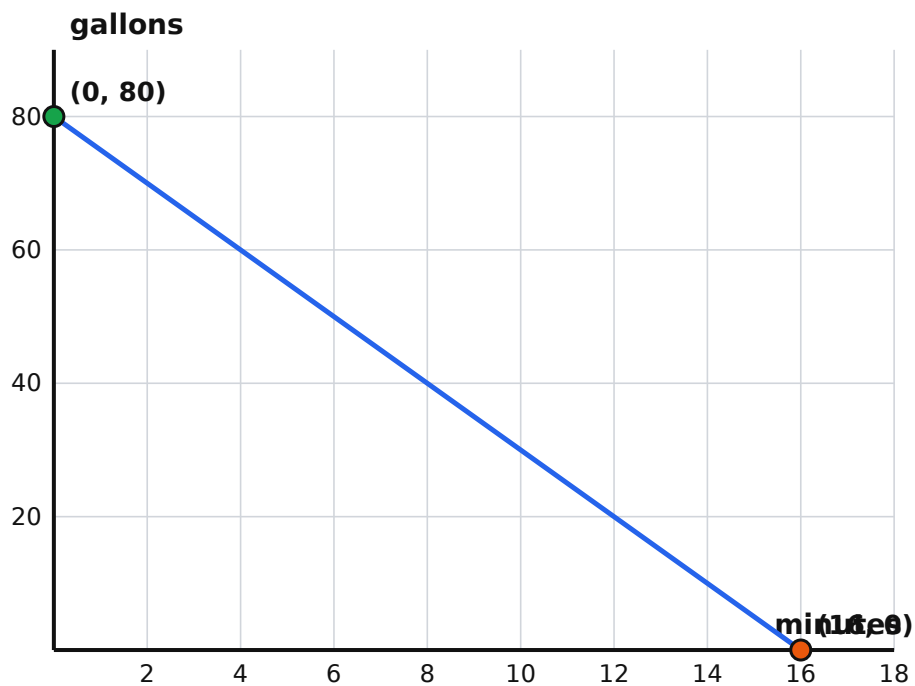
A line.

Write the equation of the line.

Exercise 6 - Savings model

Jamal has \\$50 and adds \\$12 each week. Write a function for his savings S after w weeks and find S when $w=10$.

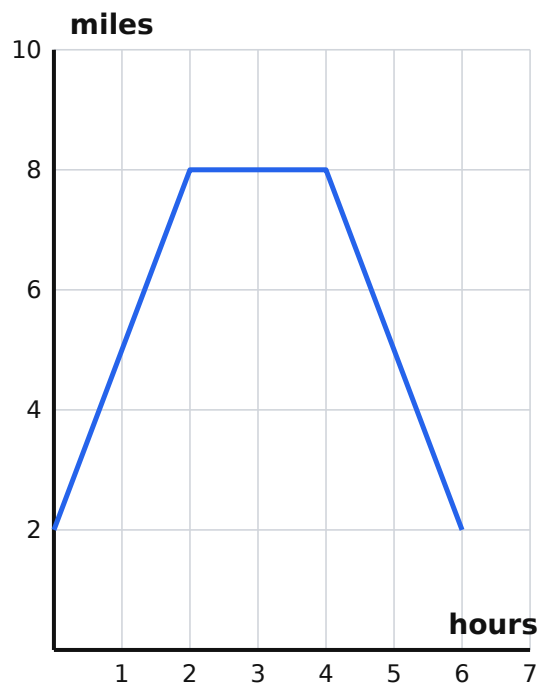
Exercise 7 - Draining tank



Gallons in a tank over time.

A tank holds 80 gallons and drains 5 gallons each minute. Write the function and find when it is empty.

Exercise 8 - Describe the graph



Graph of a bike ride.

Describe the graph in words, saying where it is increasing, constant and decreasing.

Exercise 9 - Table to equation

A table has the points (0,15), (2,25) and (4,35). Write the linear function.

Exercise 10 - Plant height

week	2	5	8
height	9	18	27

The table shows the height of a bean plant in inches. Find the rate of change and the height at week 0.

Exercise 11 - Bike rental

A bike shop charges \$6 plus \$4 per hour. Write the cost function and find how many hours you can rent for \$30.

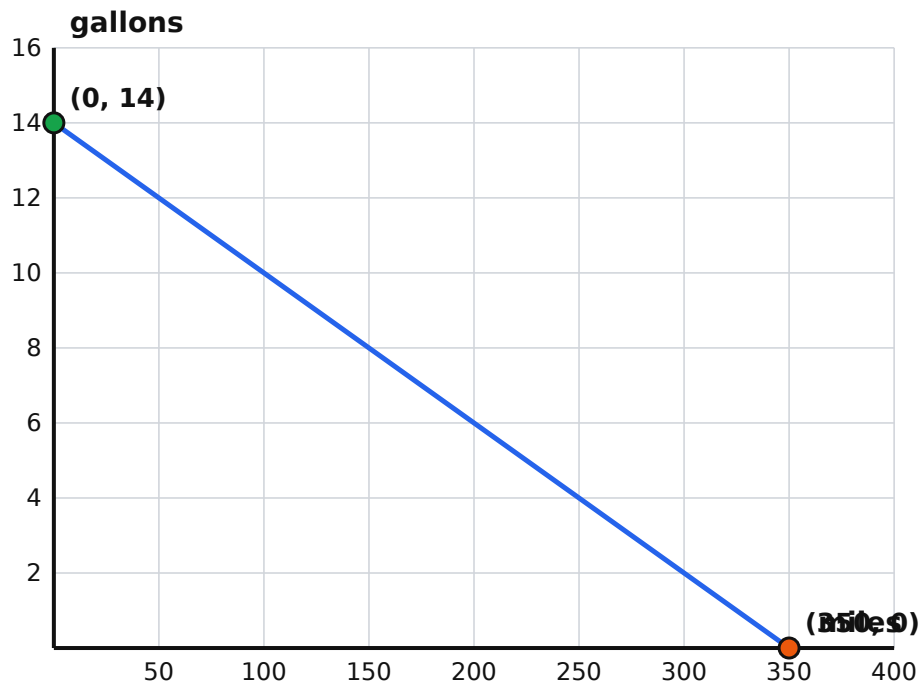
Exercise 12 - Constant rate in a table

Find the rate of change from the table: $x=1,4,7$ and $y=10,22,34$.

Exercise 13 - Temperature conversion

The function $F=1.8C+32$ converts $^{\circ}\text{C}$ to $^{\circ}\text{F}$. Find F when $C=20$ and explain what 1.8 means.

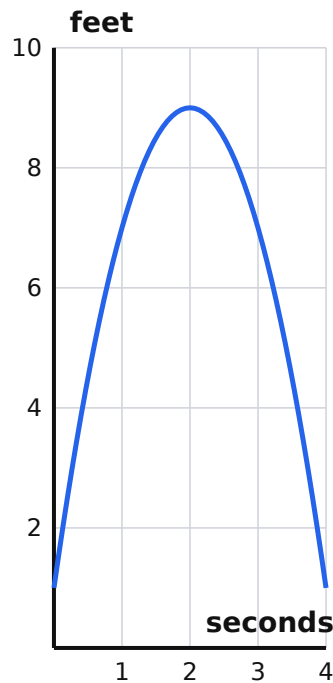
Exercise 14 - Gas tank



Gallons left after m miles.

A car's tank has 14 gallons and uses 0.04 gallon per mile. Write the function, find the gallons left after 250 miles, and find the miles until it is empty.

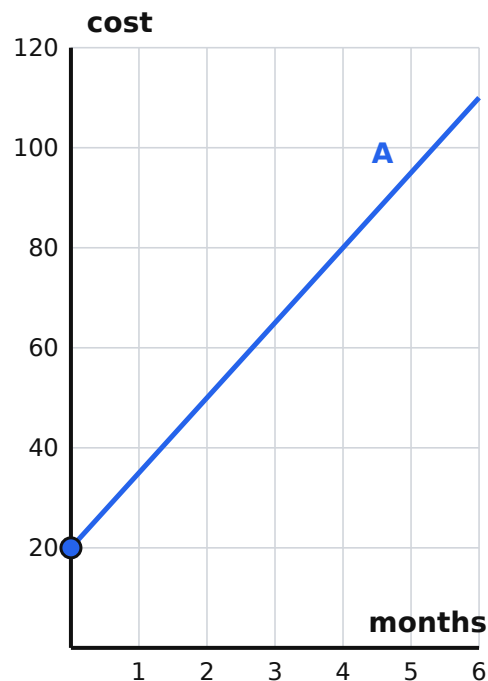
Exercise 15 - Qualitative curve



Height of a ball over time.

A ball is thrown upward. Is the graph of its height linear or nonlinear? Describe how the height changes.

Exercise 16 - Compare two plans



Plan A cost.

Plan A is shown. Plan B charges \$10 to start and \$18 per month. Which plan has the greater rate? Which costs less after 6 months?

Exercise 17 - Proportional special case

A model has initial value 0. What does that tell you about the relationship?

Exercise 18 - Streaming

A streaming service charged Mei \$27 after 3 months and \$45 after 5 months. Assume a linear model. Find the monthly rate and the sign-up fee.

Exercise 19 - Meaning of an intercept

A line models the water level in a pond: $L = 30 - 2d$ inches after d days. Find the d -intercept and explain its meaning.

Exercise 20 - Piecewise story



Maya's walk to the store.

The graph shows Maya's distance from home. Describe what she did in each part of the trip.