

Grade 8 - Using Linear Models to Predict - Worksheet

Common Core 8.SP.A.3 · maths-pdf.fr/en/

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

These 21 problems practice linear models for data, interpreting slope and intercept, and making predictions (Common Core 8.SP.A.3). 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 interpret slope and intercept in context and decide when predictions are reasonable. Use the answer key afterwards to check every step.

Grade 8 · Common Core State Standards: **8.SP.A.3**

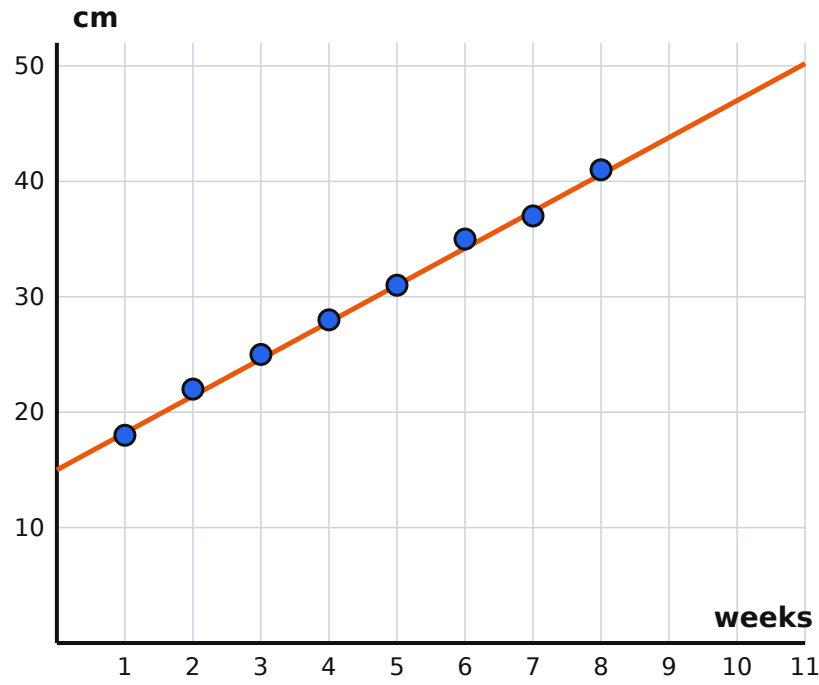
Exercise 1 - Interpret the slope

A bean plant's height in centimeters is modeled by $y = 3.2x + 15$, where x is the number of weeks. Interpret the slope.

Exercise 2 - Interpret the intercept

In the plant model $y = 3.2x + 15$, interpret the intercept.

Exercise 3 - Predict



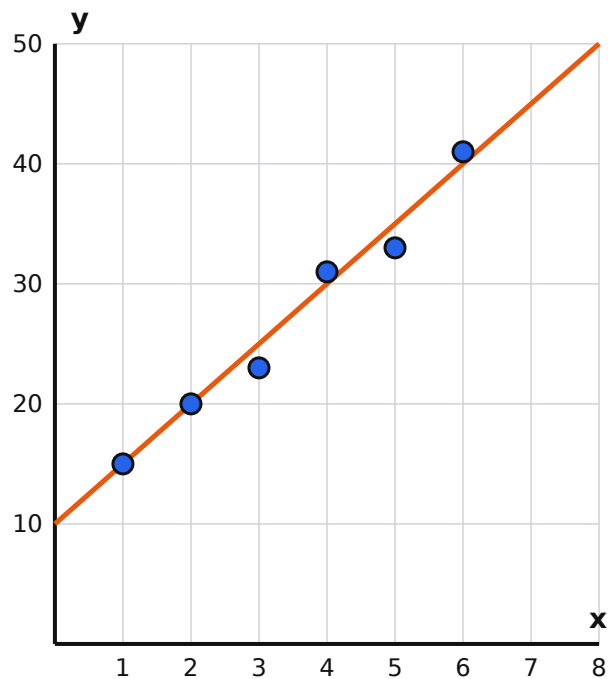
Plant model.

Use $y = 3.2x + 15$ to predict the plant's height at week 10.

Exercise 4 - Equation from two points

A trend line passes through (2,25) and (8,55). Write its equation.

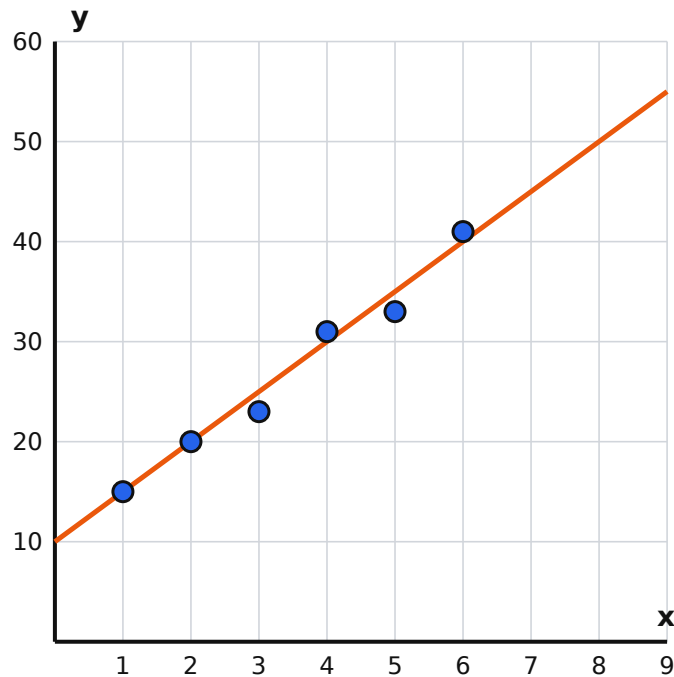
Exercise 5 - Equation from a graph



Trend line through (0, 10) and (5, 35).

The trend line passes through (0,10) and (5,35). Write its equation.

Exercise 6 - Predict from a graph



Same trend line.

Use the trend line $y = 5x + 10$ to predict y when $x = 7$.

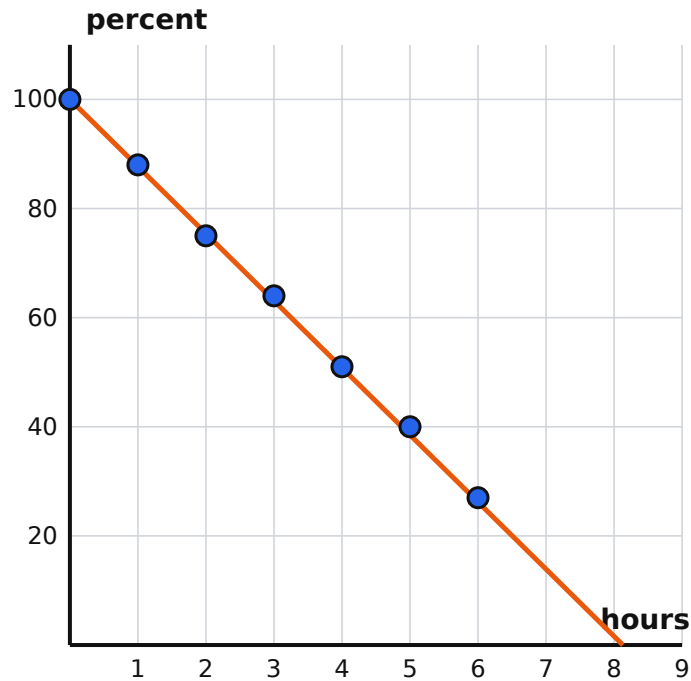
Exercise 7 - Solve for x

A model for the cost of a school field trip is $y = 4x + 12$, where x is the number of students and y is the cost in dollars. How many students can go for \$52?

Exercise 8 - Interpret both

A trend line for a delivery company is $y = 2.5x + 6$, where x is miles and y is the cost in dollars. Interpret the slope and the intercept.

Exercise 9 - Battery



Phone battery while streaming.

A phone battery follows $y = -12.3x + 100$, where y is the percent left after x hours. Interpret the slope and predict the percent left after 5 hours.

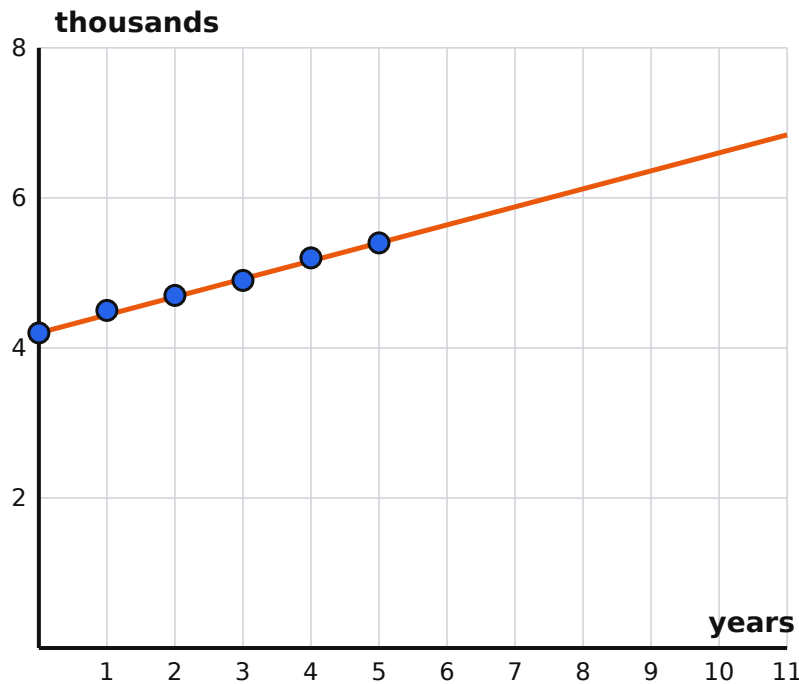
Exercise 10 - When is the battery empty

Use the battery model $y = -12.3x + 100$ to find when the battery reaches 0 percent. Round to the nearest tenth.

Exercise 11 - Interpolate or extrapolate

The plant data cover weeks 1 to 8. Is predicting the height at week 6 interpolation or extrapolation? What about week 30?

Exercise 12 - Town population



Town population in thousands by years since 2020.

The population of a town (in thousands) is modeled by $y = 0.24x + 4.2$, where x is the number of years since 2020. Interpret the slope and predict the population in 2030.

Exercise 13 - Population target

Use the town model $y = 0.24x + 4.2$ to estimate the year the population reaches 8 thousand.

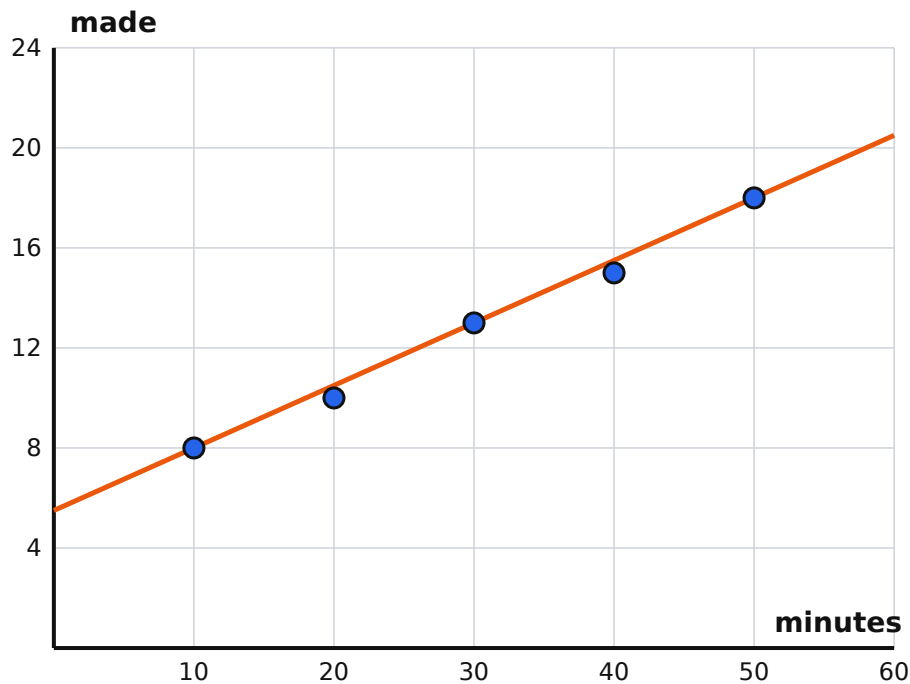
Exercise 14 - Residual

At week 5 a plant is actually 33 cm tall. The model $y = 3.2x + 15$ predicts a height. Find the predicted height and the difference from the actual height.

Exercise 15 - Meaning of the x-intercept

A model for the water left in a barrel is $y = -2x + 30$, where x is the number of days and y is the gallons left. Find the value of x when $y = 0$ and explain its meaning.

Exercise 16 - Free throws



Practice time and free throws made.

Priya's practice data have the trend line $y = 0.25x + 5.5$, where x is practice minutes and y is free throws made out of 20. Interpret the slope and predict the free throws made after 60 minutes of practice.

Exercise 17 - Two predictions

Two students model the cost of a pizza party. Mei uses $y = 12x + 20$ and Noah uses $y = 14x + 10$, where x is the number of pizzas. For which numbers of pizzas does Noah's model give the lower cost?

Exercise 18 - Make a model

Ethan's scooter rental costs \\$9 for 1 hour and \\$21 for 3 hours. Assume a linear model and write an equation for the cost y of x hours. Interpret the slope and intercept.

Exercise 19 - Is the intercept meaningful?

A model for a person's weight (pounds) by height (inches) is $y = 4.5x - 160$. Is the intercept meaningful? Explain.

Exercise 20 - Choose the model

Which model better describes a downward pattern: $y = 2x + 3$ or $y = -2x + 30$? Explain.

Exercise 21 - Explain a prediction

Sofia uses a trend line to predict a test score of 105 out of 100. Explain why this prediction is not reasonable and what it shows about the model.