

Graph the Relationship

Write an equation, then show it on a graph.

HIGH SCHOOL • HSA-CED.A.2

CCSS.Math.Content.HSA-CED.A.2 "Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales."

NAME _____

DATE _____

BUILD THE RULE

Use the rate of change as the coefficient and the starting amount as the constant. Put the independent variable on the horizontal axis and the dependent variable on the vertical axis, then label both axes and choose a scale.

WORKED EXAMPLE

A mural project starts with 4 painted panels and adds 3 panels each day d . Write P in terms of d , then graph it.

1. Let d = days and P = painted panels.
2. The project starts at 4, so use $+ 4$.
3. It adds 3 panels each day, so use $3d$.
4. $P = 3d + 4$. Plot $(0,4)$ and $(2,10)$.

Answer: $P = 3d + 4$; horizontal axis d , vertical axis P , scale 1.

PRACTICE 5 problems

- 1** A game score s starts at -2 and gains 5 points each round r . Write and graph an equation.

ANSWER _____

- 2** Temperature T is 9 degrees at the start and rises 2 degrees each hour h . Write and graph an equation.

ANSWER _____

- 3** p is 6 less than $4n$. Write and graph an equation.

ANSWER _____

- 4** A tank has 8 L of water and drains 3 L each minute m . Write and graph an equation for L .

ANSWER _____

- 5** A plant is 1 cm tall and grows 3 cm every 2 days d . Write and graph an equation for height H .

ANSWER _____

APPLY IT Show your work

- 1** Your club orders shirts. The printer charges a \$5 setup fee plus \$2 per shirt n . Write an equation for total cost C and graph it.

WORK SPACE

ANSWER _____

- 2** A skateboard rental costs \$7 to start and \$4 per hour h . Write an equation for total cost C and graph it.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A music app has Plan A, $C = 3a + 6$, and Plan B, $C = 5a + 2$, where a is albums downloaded. Graph both equations on the same axes. At how many albums do the plans cost the same amount?

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A game score s starts at -2 and gains 5 points each round r . Write and graph an equation.	$s = 5r - 2$; axes r, s ; scale 1; plot $(0,-2), (1,3)$.
2	Temperature T is 9 degrees at the start and rises 2 degrees each hour h . Write and graph an equation.	$T = 2h + 9$; axes h, T ; scale 1; plot $(0,9), (1,11)$.
3	p is 6 less than $4n$. Write and graph an equation.	$p = 4n - 6$; axes n, p ; scale 1; plot $(0,-6), (2,2)$.
4	A tank has 8 L of water and drains 3 L each minute m . Write and graph an equation for L .	$L = 8 - 3m$; axes m, L ; scale 1; plot $(0,8), (2,2)$.
5	A plant is 1 cm tall and grows 3 cm every 2 days d . Write and graph an equation for height H .	$H = \frac{3}{2}d + 1$; axes d, H ; scale 1; plot $(0,1), (2,4)$.

PART 2 • APPLY IT

- $C = 2n + 5$; axes n, C ; scale 1; plot $(0,5), (3,11)$. The setup fee is the starting cost, and the per-shirt charge is the rate.
- $C = 4h + 7$; axes h, C ; scale 1; plot $(0,7), (2,15)$. The starting fee is 7, and each hour adds 4.

CHALLENGE

Axes a, C ; scale 1. Plan A points: $(0,6), (2,12)$. Plan B points: $(0,2), (2,12)$. The plans cost the same at 2 albums, $C = 12$.

Accept equivalent equation forms. Graphs should have labeled axes, a stated scale, and a correct line through the listed points.