

Proportional Power

Build matching tables, graphs and equations.

GRADE 8 • TEKS 8.5.A

8.5.A "represent linear proportional situations with tables, graphs, and equations in the form of $y = kx$;"

NAME _____

DATE _____

Connect the representations

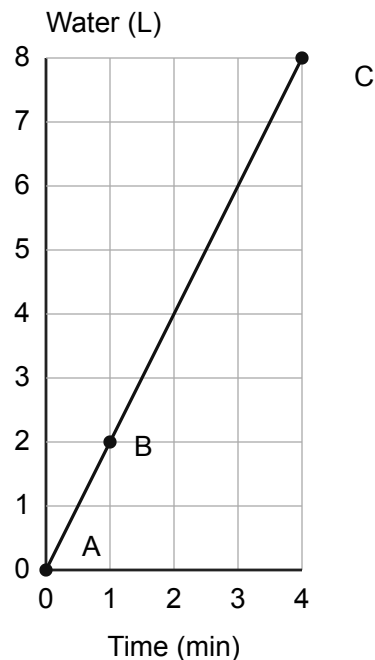
A proportional situation has $y = kx$ with constant rate k and zero starting amount. Its graph lies on a straight line through the origin. Continuous quantities may use a segment; whole-item counts use separate points.

Worked example

A tap fills at 2 L/min. Represent total water y after x minutes, starting empty. Read the plotted model for $0 \leq x \leq 4$.

Each minute adds 2 L, so $k = 2$ L/min. At $x = 0$, $y = 0$; $y/x = 2$ for every nonzero input.

$y = 2x$; table pairs (0,0), (1,2), (4,8). A straight graph through the origin.



Use the stated variables, units and graph intervals. Plot only when asked. Label points clearly and use the response lines for equations, tables and explanations.

1. Practice

A trail walker travels at 3 km/h from the starting point. Write $y = kx$ for distance y after x hours. Give a two-column table for $x = 0, 1, 2, 3$ and interpret k .

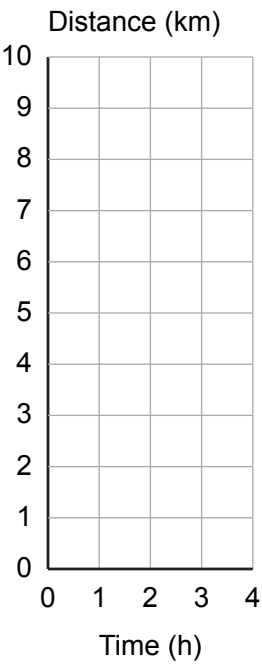
2. Practice

Complete the table for the proportional relationship. Find k and write its equation. Explain how you checked all the nonzero rows.

x	y
0	
1	3
2	
4	

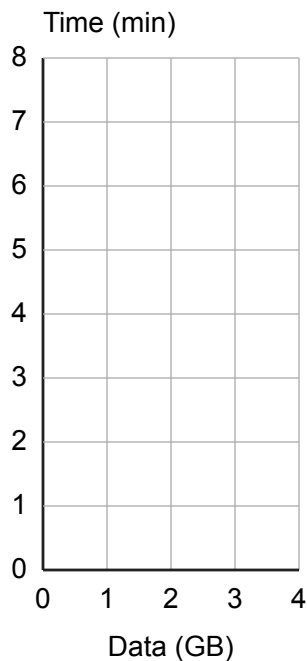
3. Practice

Graph the trail walk from Task 1 for $0 \leq x \leq 3$. Mark all four table points and connect them. Explain what the point at $x = 2$ means.

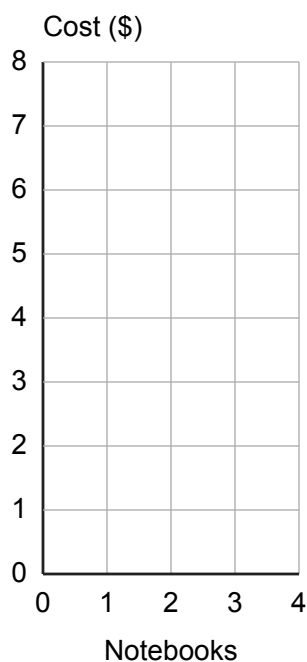


4. Practice

An upload takes $\frac{3}{2}$ minutes per GB. Write $y = kx$, give a table for $x = 0, 2, 4$, and graph it for $0 \leq x \leq 4$. Explain the units of k .

**5. Apply**

Notebooks cost \$2 each with no fee. Write an equation and a table for 0, 1, 2, 3 notebooks. Plot the four points. Should you connect them for this purchasing situation?



6. Apply

A line representing a proportional situation contains (4,10). Find k and its equation. Give two more points, including the origin, and explain why (2,6) is not on it.

7. Challenge

Mia writes $y = 4x + 2$ for a proportional situation and plots (0,2). Correct the equation to keep rate 4 while making it proportional. Give three table pairs and explain how its graph must change.

Accept equivalent correct reasoning. Check plotted points and constructed representations as well as written answers. Numbered solutions match the student tasks.

Task 1

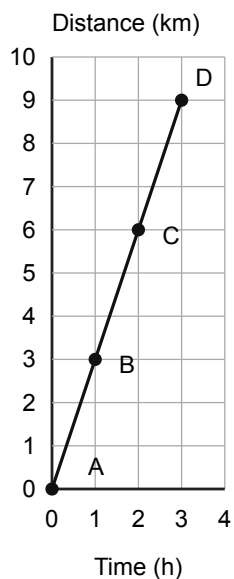
$y = 3x$; table: (0,0), (1,3), (2,6), (3,9). $k = 3$ km/h.

Task 2

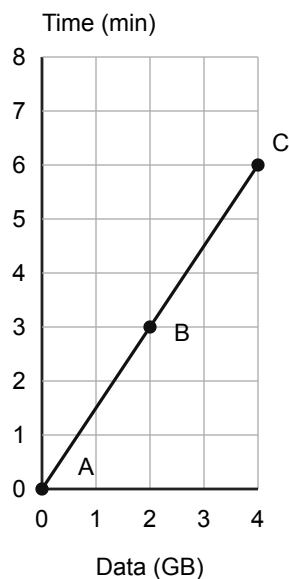
$k = 3$; $y = 3x$. Missing y -values are 0, 6 and 12. For $x = 1, 2, 4$, $y/x = 3$.

Task 3

Plot (0,0), (1,3), (2,6), (3,9) and connect. At 2 hours the walker is 6 km from the start.

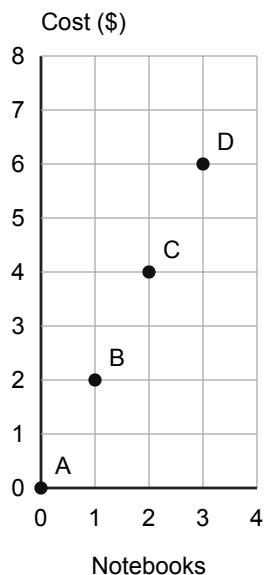
**Task 4**

$y = (3/2)x$; table (0,0), (2,3), (4,6). Connect these points. $k = 1.5$ minutes per GB.



Task 5

$y = 2x$; table (0,0), (1,2), (2,4), (3,6). Plot only the four points: whole notebooks are sold, so fractional counts are not allowed.



Task 6

$k = 10/4 = 5/2$; $y = (5/2)x$. For example, (0,0) and (2,5); at $x = 2$ the output is 5, not 6.

Task 7

$y = 4x$; for example (0,0), (1,4), (2,8). Remove the starting amount 2: every point moves down 2 units and the graph passes through the origin.