

Plot the Pattern

Graph proportional relationships from tables, rules, and real situations.

GRADE 7 • MA.7.AR.4.3

MA.7.AR.4.3 "Given a mathematical or real-world context, graph proportional relationships from a table, equation or a written description."

NAME _____

DATE _____

PART 1: PRACTICE

A proportional relationship can be written as $y = kx$. Its graph is a straight line that passes through $(0, 0)$. Find matching x - and y -values, plot the points, and draw the line through them.

WORKED EXAMPLE

Graph $y = 11x$ for $x = 0, 4$, and 8 .

1. Start with $y = 11x$.
2. When $x = 0$, $y = 11(0) = 0$.
3. When $x = 4$ and $x = 8$, $y = 44$ and $y = 88$.
4. Plot $(0, 0)$, $(4, 44)$, and $(8, 88)$, then draw a straight line through them.

Answer: Line $y = 11x$ through $(0, 0)$, $(4, 44)$, and $(8, 88)$.

PRACTICE 6 problems

- 1** Graph the relationship in the table. x : 0, 2, 5, 7 y : 0, 6, 15, 21

ANSWER _____

- 2** Graph $y = 5x$. Use $x = 0, 1, 3$, and 6 .

ANSWER _____

- 3** A game costs 7 tokens per round. Let x be the number of rounds and y be the number of tokens. Graph the relationship for $x = 0, 1, 2$, and 3 .

ANSWER _____

- 4** Graph the relationship in the table. x : 0, 3, 6, 9 y : 0, 6, 12, 18

ANSWER _____

- 5** Graph $y = \frac{1}{2}x$. Use $x = 0, 2, 6$, and 10 .

ANSWER _____

- 6** A trail mix recipe uses $\frac{3}{5}$ cup of chocolate chips for each batch. Let x be the number of batches and y be the cups of chocolate chips. Graph the relationship for $x = 0, 5, 10$, and 15 .

ANSWER _____

APPLY IT Show your work

- 1** Part 2: Apply. Jordan saves \$3 each week for a concert ticket. Let x be the number of weeks and y be the total dollars saved. Graph the relationship for 0 through 5 weeks.

WORK SPACE

ANSWER _____

- 2** An esports club needs 9 controller cables for each team. Let x be the number of teams and y be the number of cables. Graph the relationship for 0 through 4 teams.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Part 3: Challenge. A fitness app awards 12 points for each lap you complete. Let x be the number of laps and y be the points. Graph the relationship for $x = 0$ through 5. Label the y -axis from 0 to 60 by counting by 6. Explain why the graph rises 2 grid squares each time x increases by 1.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Graph the relationship in the table. x: 0, 2, 5, 7 y: 0, 6, 15, 21	Plot (0, 0), (2, 6), (5, 15), and (7, 21). Draw the line $y = 3x$.
2	Graph $y = 5x$. Use $x = 0, 1, 3$, and 6.	Plot (0, 0), (1, 5), (3, 15), and (6, 30). Draw the line $y = 5x$.
3	A game costs 7 tokens per round. Let x be the number of rounds and y be the number of tokens. Graph the relationship for $x = 0, 1, 2$, and 3.	$y = 7x$. Plot (0, 0), (1, 7), (2, 14), and (3, 21).
4	Graph the relationship in the table. x: 0, 3, 6, 9 y: 0, 6, 12, 18	Plot (0, 0), (3, 6), (6, 12), and (9, 18). Draw the line $y = 2x$.
5	Graph $y = 1/2x$. Use $x = 0, 2, 6$, and 10.	Plot (0, 0), (2, 1), (6, 3), and (10, 5). Draw the line $y = 1/2x$.
6	A trail mix recipe uses $3/5$ cup of chocolate chips for each batch. Let x be the number of batches and y be the cups of chocolate chips. Graph the relationship for $x = 0, 5, 10$, and 15.	$y = 3/5x$. Plot (0, 0), (5, 3), (10, 6), and (15, 9).

PART 2 • APPLY IT

- $y = 3x$. Plot (0, 0), (1, 3), (2, 6), (3, 9), (4, 12), and (5, 15).** Multiply the number of weeks by 3 to find the total saved. Plot the points and draw a straight line through the origin.
- $y = 9x$. Plot (0, 0), (1, 9), (2, 18), (3, 27), and (4, 36).** Multiply the number of teams by 9 to find the number of cables. The graph is a line through the origin.

CHALLENGE

$y = 12x$. Plot (0, 0), (1, 12), (2, 24), (3, 36), (4, 48), and (5, 60). Each grid square represents 6 points, and 12 points is 2 groups of 6, so the graph rises 2 grid squares for each lap.

Accept correctly plotted required points joined by a straight line through (0, 0). Accept additional correct points and equivalent equations, such as $y = x/2$ for $y = 1/2x$.