

Slope Matchup

Classify pairs of lines by comparing their slopes.

HIGH SCHOOL • GEO-G.GPE.5.b

GEO-G.GPE.5.b "Determine if lines are parallel, perpendicular, or neither, based on their slopes; and"

NAME _____

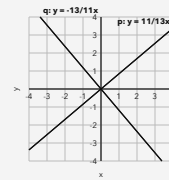
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COMPARE THE SLOPES

Lines with equal slopes are parallel. Lines are perpendicular when their slopes are negative reciprocals, so their product is -1 . A vertical line and a horizontal line are also perpendicular.

WORKED EXAMPLE

Use the graph to classify lines p and q as parallel, perpendicular, or neither.



1. The slope of p is $11/13$.
2. The slope of q is $-13/11$.
3. $(11/13)(-13/11) = -1$.
4. The slopes are negative reciprocals.

Answer: perpendicular

PRACTICE 6 problems

- 1** Classify the lines $y = 3x - 8$ and $y = 3x + 4$.

ANSWER _____

- 2** Line a passes through $(-3, 5)$ and $(0, -1)$. Line b passes through $(4, 7)$ and $(6, 3)$. Classify the lines.

ANSWER _____

- 3** Classify the lines $y = 5/6x + 7$ and $y = -6/5x - 3$.

ANSWER _____

- 4** Classify the lines $y = -4x + 9$ and $(1/5)x - y = 3$.

ANSWER _____

- 5** Classify the lines $x = 6$ and $y = -2$.

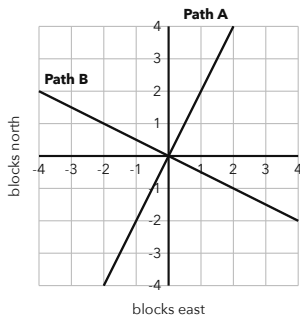
ANSWER _____

- 6** Line r passes through $(-5, 4)$ and $(3, 8)$. Line s has equation $y = 2x - 7$. Classify the lines.

ANSWER _____

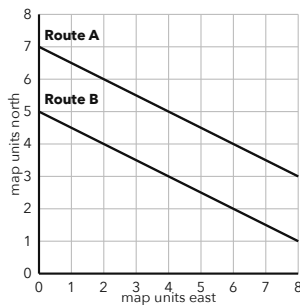
APPLY IT Show your work

- 1** A campus bike club is planning two practice routes. The grid shows the routes, where each unit is one city block. Are Path A and Path B parallel, perpendicular, or neither?



ANSWER _____

- 2** Two camera paths are shown on a coordinate map for an esports tournament. Are Route A and Route B parallel, perpendicular, or neither? State how you know.



ANSWER _____

CHALLENGE One step up

For what value of k are the lines $y = (k + 1)/2x - 3$ and $4x + y = 8$ perpendicular? Explain your reasoning.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Classify the lines $y = 3x - 8$ and $y = 3x + 4$.	parallel
2	Line a passes through $(-3, 5)$ and $(0, -1)$. Line b passes through $(4, 7)$ and $(6, 3)$. Classify the lines.	parallel
3	Classify the lines $y = 5/6x + 7$ and $y = -6/5x - 3$.	perpendicular
4	Classify the lines $y = -4x + 9$ and $(1/5)x - y = 3$.	neither
5	Classify the lines $x = 6$ and $y = -2$.	perpendicular
6	Line r passes through $(-5, 4)$ and $(3, 8)$. Line s has equation $y = 2x - 7$. Classify the lines.	neither

PART 2 • APPLY IT

1. **perpendicular** Path A has slope 2, and Path B has slope $-1/2$. Their slopes multiply to -1 , so the paths are perpendicular.
2. **parallel; both routes have slope $-1/2$.** Each route goes down 1 unit for every 2 units to the right, so each has slope $-1/2$. Equal slopes mean the routes are parallel.

CHALLENGE

$k = -1/2$. The second line has slope -4 , so a perpendicular line has slope $1/4$. Setting $(k + 1)/2$ equal to $1/4$ gives $k = -1/2$.

Accept equivalent slope work and classifications. For problem 4, accept neither only when the second equation is correctly rewritten as $y = 1/5x - 3$.