

NAME: _____

P.I. A.A.38: Determine if two lines are parallel, given their equations in any form

P.I. G.G.63: Determine whether two lines are parallel, perpendicular, or neither, given their equations

1. Write equations of three lines that are parallel to the line with equation $y = 3.5x - 2$.
2. Write equations of three lines that are perpendicular to the line with equation $y = -4x + 1$.
3. How are the graphs of the following lines similar? How are they different? $y = 3x + 2$; $y = 3x - 2$
4. Tell whether the statement “Two lines with negative slopes can be parallel” is *true* or *false*. Explain your choice.
5. Explain why lines that are perpendicular may not appear to be perpendicular on a standard graphing calculator screen. Include an example.
6. Explain how you can tell that the lines $3x + 4y = 2$ and $4x - 3y = 1$ are perpendicular without finding slopes.
7. If line 1 \parallel line 3 and line 2 \parallel line 3, then describe the relationship between lines 1 and 2.

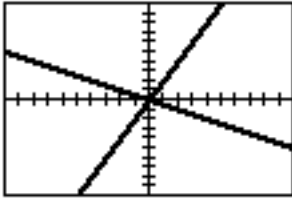
[1] Answers may vary. Sample: $y = 3.5x + 2$, $y = 3.5x + 1$, $y = 3.5x + 4$

[2] Answers may vary. Sample: $y = \frac{1}{4}x - 1$, $y = \frac{1}{4}x + 2$, $y = \frac{1}{4}x - 5$

[3] They both have the same slopes; their y-intercepts are different. They are parallel to one another.

[4] True; the slopes of parallel lines are the same and two negative slopes can be equal.

The vertical and the horizontal scales use units of different length. For example, the graphs of $y = 2x$ and $y = -0.5x$ are shown below.



[5]

Since the coefficients of x and y are switched, both coefficients of x are positive, and one coefficient of y is positive and one is negative, so the ratios for the slopes will be negative reciprocals.

Call the lines 1, 2, and 3. If line 1 is parallel to line 3, they both have the same slope, m . If line 2 is also parallel to line 3, they have the same slope, also m . Therefore, since lines 1 and 2 have the same slope, they are parallel.
