Lesson 7.4: Parallel and Perpendicular Lines

Complete the *Practice* below. When you have completed all the questions for *Lesson 7.4 Practice – IV* with your best work, mark your work by first comparing your answers to the solutions provided in the *Appendix*. Then, apply the rubric found at the beginning of the *Workbook*.

Practice – IV

1. Decide if each pair of lines is parallel, perpendicular, or neither. Explain your choice.

   a. $y = 9x + 4$ and $18x - 2y + 13 = 0$

   b. $y - 7 = \frac{3}{2}(x + 5)$ and $y = \frac{2}{3}x$

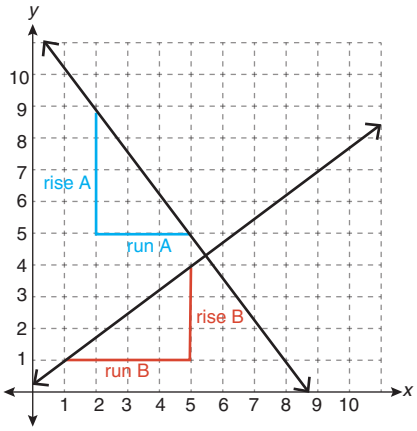
   c. $y = 2.5x + 1$ and $y = -0.4x - 1$

2. Line A passes through the points $(-1,-1)$ and $(5,3)$. Line B passes through the points $(7,-5)$ and $(1,r)$. Determine a value of r such that the two lines are

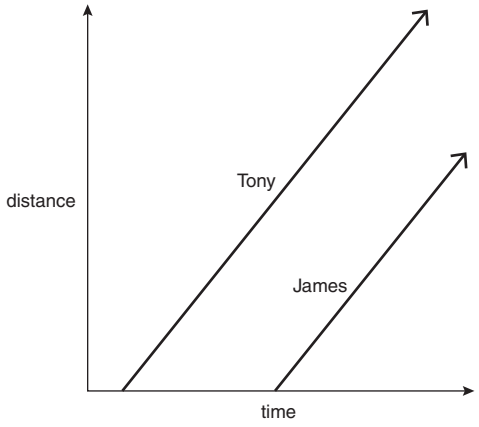
   a. parallel

   b. perpendicular

3. The grid shows two perpendicular lines. Use the information provided on the grid to show that the slopes of the lines have a product of –1.



4. Tony and James both walked home from school, as shown in the graph provided.



a. Describe a scenario that would lead to this graph.

b. The two lines in the graph are parallel. Explain what this means in the given context.

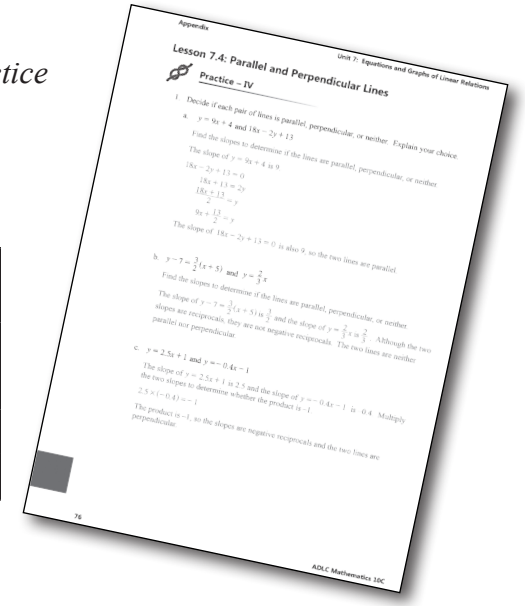
c. Suppose the two lines were not parallel. Would this guarantee that James and Tony will meet? Explain.

Mark your work for *Lesson 7.4 Practice – IV* using the solutions provided in the *Appendix*. Then, apply the rubric found at the beginning of the *Workbook*.

Transfer your self-assessed mark to the front cover of the *Workbook*.

My self-assessed mark on *Lesson 7.4 Practice – IV* is _____.

Reflect on your understanding of the concepts addressed in the *Practice* exercises in the table provided.


Appendix

Unit 7: Equations and Graphs of Linear Relations

Lesson 7.4: Parallel and Perpendicular Lines

Practice – IV

1. Decide if each pair of lines is parallel, perpendicular, or neither. Explain your choice.

a. $y = 9x + 4$ and $18x - 2y + 13$

Find the slopes to determine if the lines are parallel, perpendicular, or neither.

The slope of $y = 9x + 4$ is 9.

$18x - 2y + 13 = 0$

$18x + 13 = 2y$

$\frac{18x + 13}{2} = y$

$9x + \frac{13}{2} = y$

The slope of $18x - 2y + 13 = 0$ is also 9, so the two lines are parallel.

b. $y - 7 = \frac{3}{2}(x + 5)$ and $y = \frac{2}{3}x$

Find the slopes to determine if the lines are parallel, perpendicular, or neither.

The slope of $y - 7 = \frac{3}{2}(x + 5)$ is $\frac{3}{2}$ and the slope of $y = \frac{2}{3}x$ is $\frac{2}{3}$. Although the two slopes are reciprocals, they are not negative reciprocals. The two lines are neither parallel nor perpendicular.

c. $y = 2.5x + 1$ and $y = -0.4x - 1$

The slope of $y = 2.5x + 1$ is 2.5 and the slope of $y = -0.4x - 1$ is -0.4. Multiply the two slopes to determine whether the product is -1.

$2.5 \times (-0.4) = -1$

The product is -1, so the slopes are negative reciprocals and the two lines are perpendicular.

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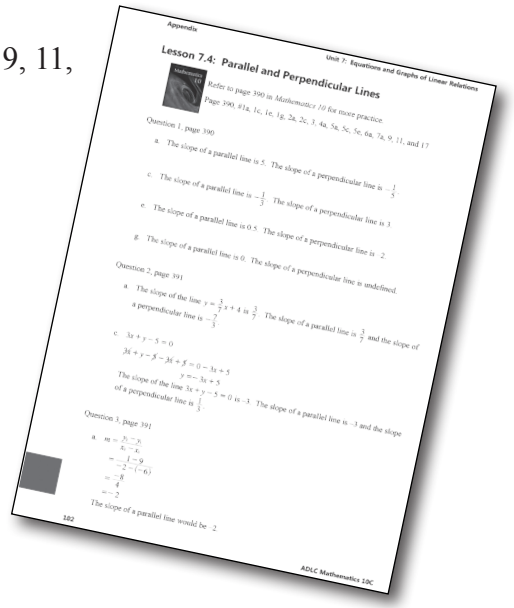
Question Number	Got it!	Almost there…	Need to retry or ask for help.
1			
2			
3			
4			

You may proceed to *Explore Your Understanding Assignment* on the next page of this *Workbook*.

Note: Before you complete *Explore Your Understanding*, you may review your skills and get more practice by completing the following problems in *Mathematics 10*.

- Page 390, #1a, 1c, 1e, 1g, 2a, 2c, 3, 4a, 5a, 5c, 5e, 6a, 7a, 9, 11, and 17

Check your work in *Enhance Your Understanding*.


Appendix

Unit 7: Equations and Graphs of Linear Relations

Lesson 7.4: Parallel and Perpendicular Lines

Refer to page 390 in *Mathematics 10* for more practice.

Page 390, #1a, 1c, 1e, 1g, 2a, 2c, 3, 4a, 5a, 5c, 5e, 6a, 7a, 9, 11, and 17

Question 1, page 390

a. The slope of a parallel line is 5. The slope of a perpendicular line is $-\frac{1}{5}$.

c. The slope of a parallel line is $-\frac{1}{3}$. The slope of a perpendicular line is 3.

e. The slope of a parallel line is 0.5. The slope of a perpendicular line is -2.

g. The slope of a parallel line is 0. The slope of a perpendicular line is undefined.

Question 2, page 391

a. The slope of the line $y = \frac{3}{7}x + 4$ is $\frac{3}{7}$. The slope of a parallel line is $\frac{3}{7}$ and the slope of a perpendicular line is $-\frac{7}{3}$.

c. $3x + y - 5 = 0$

$3x + y - 5 - 3x + 5 = 0 - 3x + 5$

$y = -3x + 5$

The slope of the line $3x + y - 5 = 0$ is -3. The slope of a parallel line is -3 and the slope of a perpendicular line is $\frac{1}{3}$.

Question 3, page 391

a. $m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{-1 - 9}{-2 - (-6)}$

$= \frac{-8}{4}$

$= -2$

The slope of a parallel line would be -2.

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