

# Rigor

Task Handout, Grade 7

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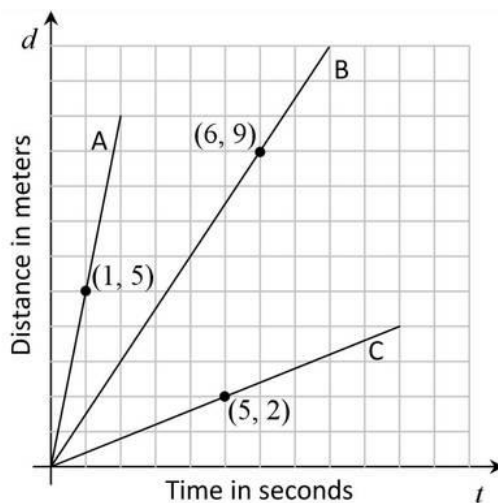
“A social justice priority in mathematics education is to openly challenge deficit thinking and the institutional tools and practices that perpetuate static views about children and their mathematics competencies. Eliminating the deficit discourse by focusing on learning rather than labels is a key step toward a more just and equitable mathematics education.” —*National Council of Supervisors of Mathematics and TODOS: Mathematics for All*

# Conceptual Understanding Task #1

## Task

Carli's class built some solar-powered robots. They raced the robots in the parking lot of the school. The graphs below are all line segments that show the distance  $d$ , in meters, that each of three robots traveled after  $t$  seconds.

- Each graph has a point labeled. What does the point tell you about how far that robot has traveled?
- Carli said that the ratio between the number of seconds each robot travels and the number of meters it has traveled is constant. Is she correct? Explain.
- How fast is each robot traveling? How did you compute this from the graph?



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# Conceptual Understanding Task #2

## Task

Malia is at an amusement park. She bought 14 tickets, and each ride requires 2 tickets.

- a. Write an expression that gives the number of tickets Malia has left in terms of  $x$ , the number of rides she has already gone on. Find at least one other expression that is equivalent to it.
- b.  $14 - 2x$  represents the number of tickets Malia has left after she has gone on  $x$  rides. How can each of the following numbers and expressions be interpreted in terms of tickets and rides?

14

-2

$2x$

- c.  $2(7 - x)$  also represents the number of tickets Malia has left after she has gone on  $x$  rides. How can each of the following numbers and expressions be interpreted in terms of tickets and rides?

7

$(7 - x)$

2

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# Procedural Skills and Fluency Task #1

Rewrite the expressions by using the distributive property and collecting like terms.

a.  $\frac{4}{5}(15x - 5)$

b.  $\frac{4}{5}\left(\frac{1}{4}c - 5\right)$

c.  $2\frac{4}{5}v - \frac{2}{3}\left(4v + 1\frac{1}{6}\right)$

d.  $8 - 4\left(\frac{1}{8}r - 3\frac{1}{2}\right)$

e.  $\frac{1}{7}(14x + 7) - 5$

f.  $\frac{1}{5}(5x - 15) - 2x$

Source: EngageNY.org of the New York State Education Department. Grade 7, Module 3, Topic A, Lesson 6. Available from <https://www.engageny.org/resource/grade-7-mathematics-module-3-topic-lesson-6/file/60381> accessed 26 May 2018. Licensed by EngageNY under CC BY-NC-SA 3.0.

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## Procedural Skills and Fluency Task #2

### Task

Sarah learned that in order to change a fraction to a decimal, she can use the standard division algorithm and divide the numerator by the denominator. She noticed that for some fractions, like  $\frac{1}{4}$  and  $\frac{1}{100}$  the algorithm terminates at the hundredths place. For other fractions, like  $\frac{1}{8}$ , she needed to go to the thousandths place before the remainder disappears. For other fractions, like  $\frac{1}{3}$  and  $\frac{1}{6}$ , the decimal does not terminate. Sarah wonders which fractions have terminating decimals and how she can tell how many decimal places they have.

- a. Convert each of the following fractions to decimals to help Sarah look for patterns with her decimal conversions:

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{10}, \frac{1}{11}, \frac{1}{12}, \frac{1}{15}.$$

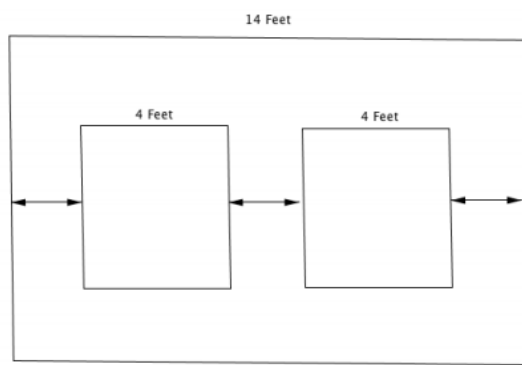
- b. Which fractions on the list have terminating decimals (decimals that eventually end in 0's)? What do the denominators have in common?
- c. Which fractions on the list have repeating decimals? What do the denominators have in common?
- d. Which fractions  $\frac{p}{q}$  (in reduced form) do you think have terminating decimal representations? Which do you think have repeating decimal representations?

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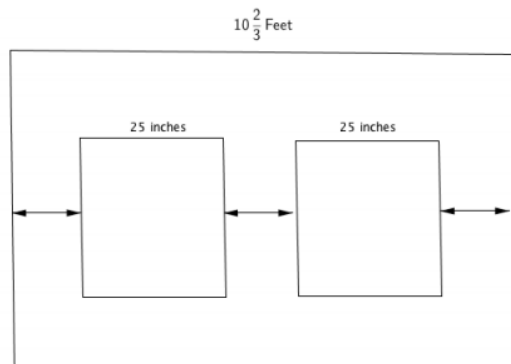
# Application Task #1

## Opening Exercise

Your brother is going away to college, so you no longer have to share a bedroom. You decide to redecorate a wall by hanging two new posters on the wall. The wall is 14 feet wide and each poster is four feet wide. You want to place the posters on the wall so that the distance from the edge of each poster to the nearest edge of the wall is the same as the distance between the posters, as shown in the diagram below.



Determine that distance. Your parents are redecorating the dining room and want to place two rectangular wall sconce lights that are 25 inches wide along a  $10\frac{2}{3}$ -foot wall so that the distance between the lights and the distances from each light to the nearest edge of the wall are all the same. Design the wall and determine the distance.



Let the distance between a light and the nearest edge of a wall be  $x$  ft. Write an expression in terms of  $x$  for the total length of the wall. Then, use the expression and the length of the wall given in the problem to write an equation that can be

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used to find that distance. Now write an equation where  $y$  stands for the number of inches: Let the distance between a light and the nearest edge of a wall be  $y$  inches. Write an expression in terms of  $y$  for the total length of the wall. Then, use the expression and the length of the wall to write an equation that can be used to find that distance (in inches). What value(s) of  $y$  makes the second equation true: 24, 25, or 26?

Source: EngageNY.org of the New York State Education Department. Grades 7, Module 3, Topic B, Lesson 7. Available from <https://www.engageny.org/resource/grade-7-mathematics-module-3-topic-b-lesson-7/file/60406> accessed 26 May 2018. Licensed by EngageNY under CC BY-NC-SA 3.0.



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## Application Task #2

A car dealership pays a wholesale price of \$12,000 to purchase a vehicle.

1. The car dealership wants to make a 32% profit.
  - a. By how much will they mark up the price of the vehicle?
  - b. After the markup, what is the retail price of the vehicle?



2. During a special sales event, the dealership offers a 10% discount off of the retail price. After the discount, how much will a customer pay for this vehicle?

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