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Resource ID#: 42486

Primary Type: Problem-Solving Task

## Gotham City Taxis

The purpose of this task is to give students an opportunity to solve a multi-step ratio problem that can be approached in many ways. This can be done by making a table, which helps illustrate the pattern of taxi rates for different distances traveled and with a little persistence leads to a solution which uses arithmetic. It is also possible to calculate a unit rate (dollars per mile) and use this to find the distance directly without making a table.

**Gotham City Taxis (Microsoft Word):** This file includes the task and related information in Microsoft Word format.

**Gotham City Taxis (PDF):** This file includes the task and related information in PDF format.

### General Information

**Subject(s):** Mathematics

**Grade Level(s):** 7

**Intended Audience:** [Educators](#), [Students](#), [Parents](#)

**Instructional Time:** 5 Minute(s)

**Freely Available:** Yes

**Keywords:** Gotham City Taxis, gotham, city, taxis, ratio, cpalms, icpalms, illustrativemathematics.org, illustrative mathematics, tasks, mathematics, math, Florida standards, resource, free, freely available, problems-based learning, student activities, write equation

**Instructional Component Type(s):** [Problem-Solving Task](#)

**Resource Collection:** Illustrative Mathematics

### Source and Access Information

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**District/Organization of Contributor(s):** FSU Lab School

**Is this Resource freely Available?** Yes

**Access Privileges:** Public

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### Aligned Standards

Name	Description
	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

[MAFS.7.EE.2.3:](#)

**Clarifications:**

**Fluency Expectations or Examples of Culminating Standards**

Students solve multistep problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. This work is the culmination of many progressions of learning in arithmetic, problem solving and mathematical practices.

**Examples of Opportunities for In-Depth Focus**

This is a major capstone standard for arithmetic and its applications.

Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

- a. Solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
- b. Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.

[MAFS.7.EE.2.4:](#)

**Clarifications:**

**Fluency Expectations or Examples of Culminating Standards**

In solving word problems leading to one-variable equations of the form  $px + q = r$  and  $p(x + q) = r$ , students solve the equations fluently. This will require fluency with rational number arithmetic (7.NS.1.1–1.3), as well as fluency to some extent with applying properties operations to rewrite linear expressions with rational coefficients (7.EE.1.1).

**Examples of Opportunities for In-Depth Focus**

Work toward meeting this standard builds on the work that led to meeting 6.EE.2.7 and prepares students for the work that will lead to meeting 8.EE.3.7.

[MAFS.7.RP.1.3:](#)

Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.