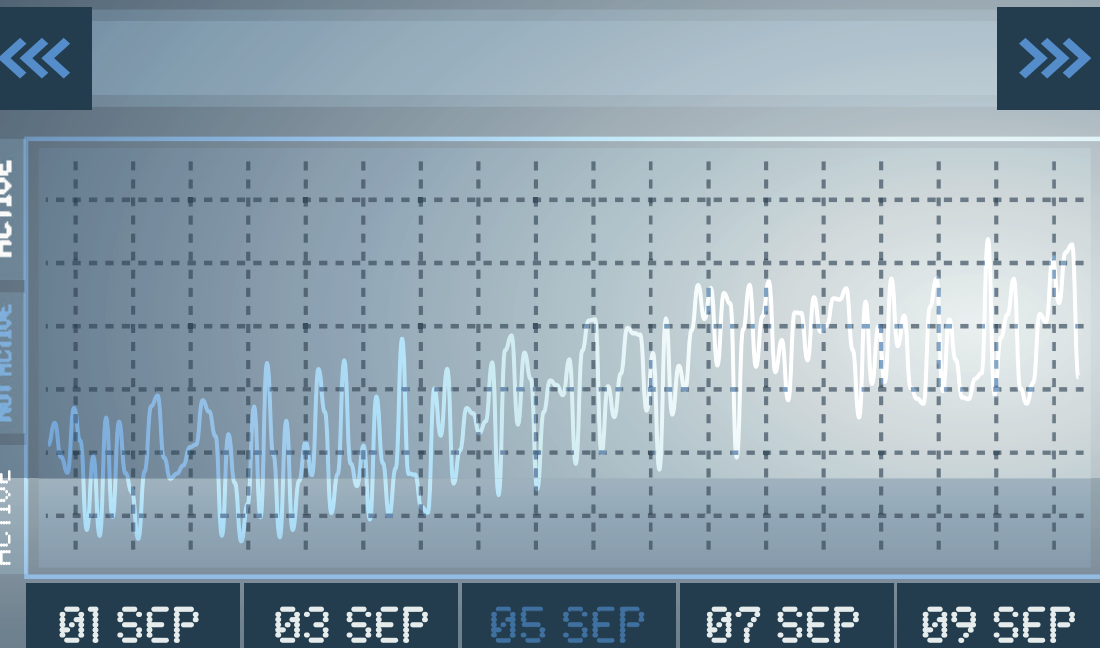


# MeTEOR Performance Task

## Seventh Grade

Mathematics

*Constant of Proportionality*



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**MeTEOR**  
CONNECTING THE DOTS

## **Performance Task Item: Constant of Proportionality**

Grade Level: 7<sup>th</sup> grade

**Focus Area:** Unit Rate and Proportion

**Essential Question:** What strategies can be used to identify the constant of proportionality in tables or graphs?

**Core Ideas:**

- Understands how to relate distance and time on a graph.
- Understands rate of change as unit rate and proportionality.
- Understands how to determine the unit rate.
- Understands how to connect a point on a line and what it represents in the context of the problem.

**Learning Targets:**

- Students will calculate unit rate.
- Students will read given diagrams to identify rate of change as proportionality.
- Students will explain their reasoning.

### **STANDARDS**

**Domain: Ratios and Proportional Relationships**

**Content Standard:**

- Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

**Supporting Standard:**

- Extend previous understandings of division to find the unit rate when solving real-world problems.

**Math Practice Standards:**

MP 1: Make sense of problems and persevere in solving them.

MP 3: Construct viable arguments and critique the reasoning of others.

MP 4: Model with mathematics.

MP 6: Attend to precision.

MP 7: Look for and make use of structure.

**Materials:**

- Performance Task
- Pencil
- Paper
- Calculator
- Graph Paper
- Ruler or straight edge

**Task/Question 1:**

**DOK Level 1:** Recall & Reproduction

**Math Practice Standards:**

- MP 6: Attend to precision.
- MP 4: Model with mathematics.

**A.** 6 melons cost \$12. How much does one melon cost?

**B.** At Ralph's fruit stand 3 apples cost 90 cents. You want to buy 7 apples. What will be the total cost for the 7 apples? Show your work.

**C.** Define Unit Rate:

**Task/Question 2:**

**DOK Level 2:** Basic Application of Skills and Concepts

**Math Practice Standards:**

- MP 1: Make sense of problems and persevere in solving them.
- MP 6: Attend to precision.

**A.** If it costs 30 cents to buy 1 apple, how much will 2 apples cost? 4 apples? Complete the table below?

Apples	Cost in Cents
1	30
2	
3	
4	
5	
6	

**B.** Explain the pattern, or mathematics used to complete the table in Part A:

**C.** Complete the sentence: For every \_\_\_\_\_ apple(s), the cost is exactly \_\_\_\_\_ cents.

**D.** Write an equation for the cost of any number of apples, using **c** for cost and **a** for number of apples.

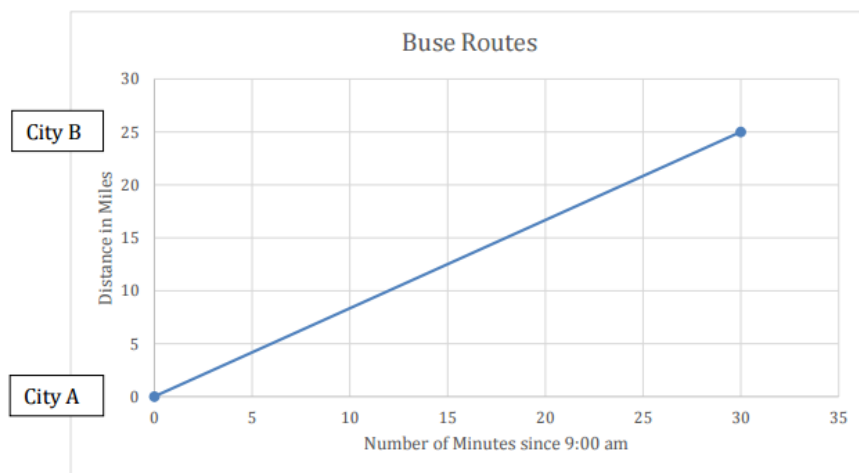
## Task/Question 3:

**DOK Level 2:** Basic Application of Skills and Concepts

### Math Practice Standards:

- MP 1: Make sense of problems and persevere in solving them.
- MP 3: Construct viable arguments and critique the reasoning of others.
- MP 7: Look for and make use of structure.

The graph below plots the journey of a bus from City A to City B. The bus leaves City A at 9:00am and arrives at City B at 9:30am



- How many miles is it from City A to City B?
- How many minutes does the journey take?
- What is the unit rate for the bus? (miles/hour)

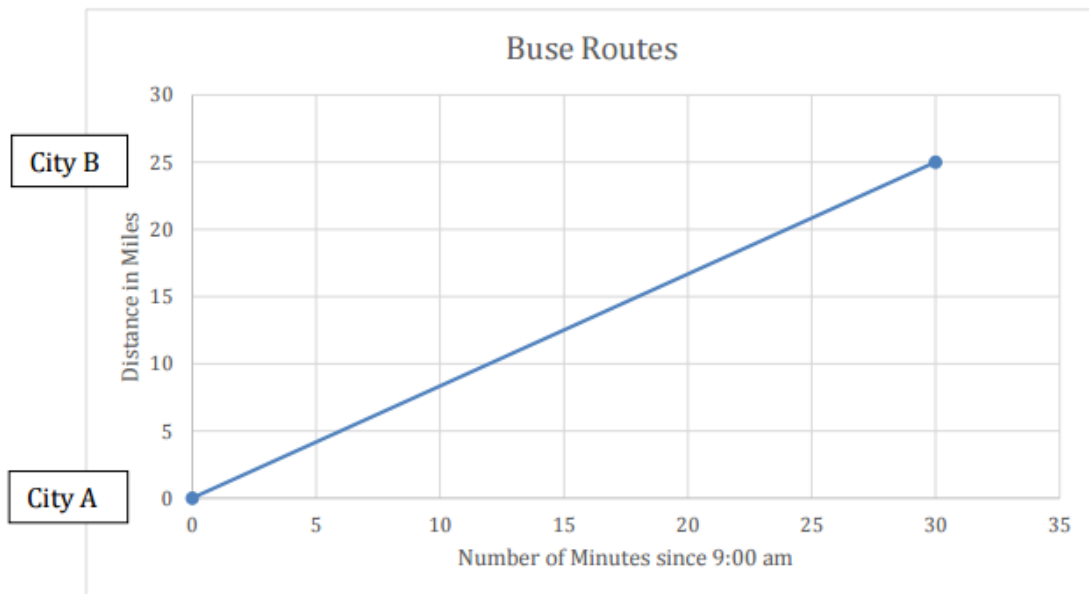
**Task/Question 4:**

**DOK Level 3:** Strategic Thinking and Complex Reasoning

**Math Practice Standards:**

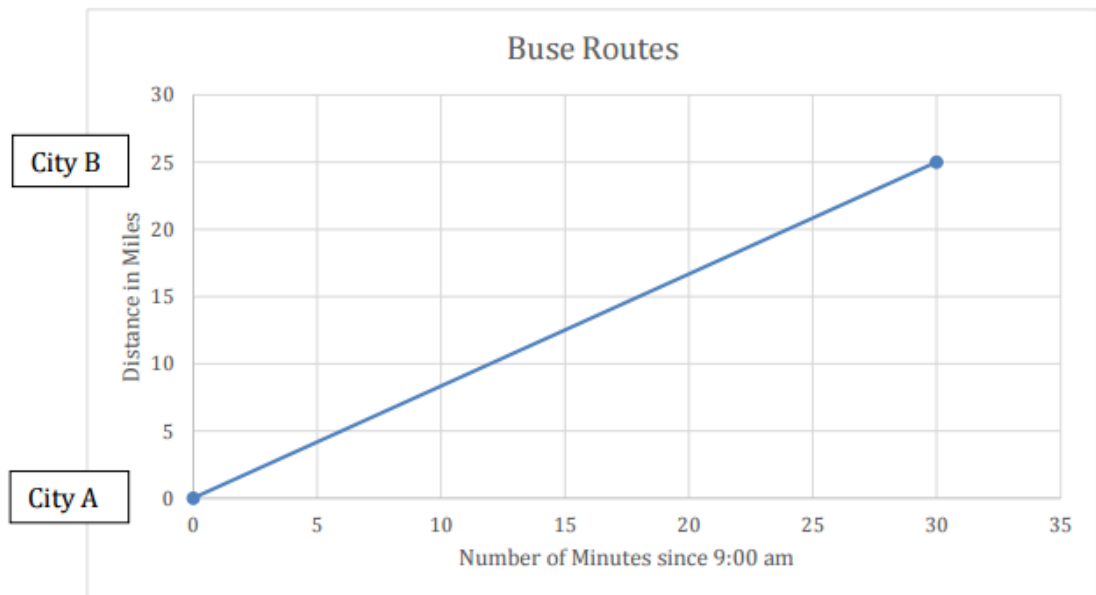
- MP 1: Make sense of problems and persevere in solving them.
- MP 3: Construct viable arguments and critique the reasoning of others.
- MP 4: Model with mathematics.
- MP 7: Look for and make use of structure.

**A.** A second leaves City B at 9:00am and arrives at City A at 9:30am. Draw a line on the diagram to show the journey of this second bus.



**B.** At what time do the two buses pass each other? Describe how you determined your answer.

- C. Buses leave City A and City B every 10 minutes during the morning, repeating the two journeys shown on your graph. On your graph, draw a line to show the bus that leaves City A at 9:20 am.



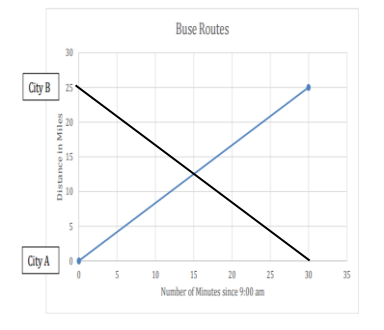

- D. How many buses traveling in the opposite direction will this bus meet before it reaches City B? How is your solution the **most efficient** for solving this problem?

## Complete Performance Task Scoring Rubric Constant of Proportionality

19-23 Proficient 14-18 Good 9-13 Satisfactory 5-8 Poor 0-4 Unsatisfactory

	Depth of Knowledge Level	Points	Total Possible Points for Task	Total Points Earned by Student														
<p><b>Task 1:</b></p> <p>A. \$2.00</p> <p>B. \$2.10; Unit rate is \$.30; \$.30 x 7 apples is \$2.10</p> <p>C. Unit Rate is a comparison of two measurements in which one of the terms has a value of 1.</p>	<b>1</b>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p>	<b>3</b>															
<p><b>Task 2:</b></p> <p>A.</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Apples</th> <th style="padding: 5px;">Cost in Cents</th> </tr> </thead> <tbody> <tr><td style="padding: 5px;">1</td><td style="padding: 5px;">30</td></tr> <tr><td style="padding: 5px;">2</td><td style="padding: 5px;">60</td></tr> <tr><td style="padding: 5px;">3</td><td style="padding: 5px;">90</td></tr> <tr><td style="padding: 5px;">4</td><td style="padding: 5px;">120</td></tr> <tr><td style="padding: 5px;">5</td><td style="padding: 5px;">150</td></tr> <tr><td style="padding: 5px;">6</td><td style="padding: 5px;">180</td></tr> </tbody> </table> <p>B. Answers will vary. Cost increases by 30 each time. Unit rate of .30 per apple.</p> <p>C. One, 30</p> <p>D. <math>C = .3a</math></p>	Apples	Cost in Cents	1	30	2	60	3	90	4	120	5	150	6	180	<b>2</b>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>2</b></p> <p><b>2</b></p>	<b>10</b>	
Apples	Cost in Cents																	
1	30																	
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4	120																	
5	150																	
6	180																	



<p><b>Task 3:</b></p> <p>A. 25</p> <p>B. 30</p> <p>C. 50m/hr</p>	<b>2</b>	<b>1</b> <b>1</b> <b>1</b>	<b>3</b>	
<p><b>Task 4:</b></p> <p>A.</p> <div style="text-align: center;">  </div> <p>B. 15 minutes after departure. 9:15. Answers will vary. Reading the graph, using unit rate, 1/2 of 30 minutes.</p> <p>C.</p> <div style="text-align: center;">  </div> <p>D. 3. Answers will vary. (The trip takes 30 minutes, and each bus is leaving 10 minutes apart, the unit rate stays consistent.)</p>	<b>3</b>	<b>1</b>  <b>2</b>  <b>2</b>  <b>2</b>	<b>7</b>	
<b>TOTAL POINTS:</b>				



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