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| 7th Unit 3 – Equations  Performance Task 5 |
| ***Standard(s) Addressed:***  **7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.  **7.EE.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.  **7.EE.3** 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.  **7.EE.4** 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.  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.  ***Standards for Mathematical Practice:***   |  |  | | --- | --- | | 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.5 | Use appropriate tools strategically. | | MP.6 | Attend to precision. | | MP.8 | Look for and express regularity in repeated reasoning. | |
| ***Task: Taxi Ride***  You and your friend decide to take a taxicab to check out a new science exhibit at the Museum of Life and Science downtown.  The table below shows the cost of each mile traveled in the taxicab.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | ***Miles Traveled*** | **0** | **1** | **2** | **3** | **4** | **5** | | ***Cost of Taxi Ride*** | **$10** |  |  | **$15.25** |  |  |  1. Fill in the table to show how much it will cost to travel 1, 2, 4, and 5 miles in the taxicab. 2. Write an algebraic equation for the total cost *c* based on the amount of miles *m* traveled. 3. If the museum is miles away from your house, how much will the taxi ride cost? Use the equation from Question 2 to solve. 4. Before you started your trip, you and your friend agreed to split the cost of the ride. However, on arrival to the museum, you realized you only have enough money to pay for of your half. If your friend covers the remainder of your half, how much money will you owe them?   After your visit at the museum you and your friend decide to take the bus back home. The bus driver said the total cost of the trip would be half the difference of 4 times the amount of miles and 2.   1. Write an algebraic equation for the total cost *c* of the bus ride based on the amount of miles *m* traveled*.* 2. How much would the bus ride back to your house cost? Use the equation from Question 5 to solve. 3. Between the taxicab and the bus, which mode of transportation is the cheapest? How much money do you and your friend save together? How much do you save individually, when you and your friend split the cost? |
| ***Solution and Rubric:***   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | ***Miles Traveled*** | **0** | **1** | **2** | **3** | **4** | **5** | | ***Cost of Taxi Ride*** | **$10** | **$11.75** | **$13.50** | **$15.25** | **$17** | **$18.75** |  1. *c = 10 + 1.75m* 2. *c* = 10 + 1.75(30.5)   *c =* 10 + 53.375  *c = $63.38*   1. Half of the trip would cost $31.69. If you can only pay for ¾ of the half (about 23.77 dollars), then your friend would pay approximately $7.93 dollars on your behalf. 2. *c = ½ ( 4m – 2 )* 3. c = ½ (4(30.5) – 2)   c = ½ (122 - 2)  c = ½ (120)  c = $60   1. The bus is the cheaper mode of transportation. Together, you would save $3.38 and individually you save $1.69.  |  |  |  |  | | --- | --- | --- | --- | | **Level I** | **Level II** | **Level III** | **Level IV** | | Student demonstrates limited or no understanding of writing and solving equations. The solutions do not address any of the mathematical concepts in the task. There is no explanation of the solution. | Student demonstrates a vague understanding of writing and solving equations. The solutions address some, but not all the mathematical concepts presented in the task. Where required, explanations are incomplete or not clear. | Student demonstrates nearly complete understanding of writing and solving equations. The solutions address almost all of the mathematical concepts presented in the task. Minor errors may exist. Where required, there is a clear explanation of the solution. | Student demonstrates complete understanding of writing and solving equations. The solutions completely address all mathematical concepts presented in the task. Where required, there is a clear, proficient explanation of the solution. | |
| ***Source(s):*** |