Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_ Class \_\_\_\_\_\_\_\_\_

The Hendersons are planning a family vacation and have decided to take a two-week road trip to visit three national parks. Looking at a map, they estimated that they will drive 1,150 miles during their trip. The Henderson’s investigate costs of different car rental companies. The following is the information they gathered:

* Let’s Go Rental Cars: **$220 per week plus 10 cents per mile.**
* Smooth Ride Rentals: **$100 per week plus 40 cents per mile.**
* Cheap Wheels: **NO weekly charge but charges 60 cents per mile driven.**
* Uncle Teddy’s Rentals: **$300 per week and has no charge per mile.**

1. *The companies want to provide their customers with a formula they can use to estimate the cost of renting from them. Construct a formula for each company.*

*Lets Go Rental Cars \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Smooth Ride Rentals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Cheap Wheels \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Uncle Teddy’s Rentals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

1. *Which company should the Hendersons use? Using a table, graph, or formula as a reference, explains why this is true.*
2. *For which company is the total rental cost proportional to the number of miles driven? How do you know? Explain your answer using a table, graph or equation.*

*\*4. Is it always true that one company is cheaper or less expensive than another? For example, if the Hendersons drove 500 miles, which company would be the least expensive? Should the Hendersons use the same company if they drove 5000 miles?*

*Standards Addressed:*

*8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*

*8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.*

*Define, evaluate, and compare functions.*

*8.F.3 Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*

*Use functions to model relationships between quantities.*

*8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.*

*8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.*

*Rubric*

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| ***Score*** | ***Description*** |
| *4* | * *Students clearly and correctly provide an equation for each car rental company.* * *An explanation that cites both a graph or table, and/or uses an equation, is provided to explain which company is the best option for the Hendersons’ particular situation.* * *Students are able to determine the proportionality of a function given a table, graph or equation* * *Students analyze by comparing tables, graphs, or equations the best rental company under different scenarios.* |
| *3* | * *Students provide an equation for each car rental company.* * *A partial explanation is provided to explain which company is the best option for the Hendersons’ particular situation and a reference is made to a graph, table or equation to support their answer.* * *Students are able to determine the proportionality of a function, but do not give a complete explanation.* * *Students determine which company might be better under a certain situation, but do not provide proof or justify their response* |
| *2* | * *Students only provide some of the equations for the rental car companies, or write expressions instead of equations.* * *An incomplete explanation is provided to explain which company is the best option for the Hendersons’ particular situation without referencing the data.* * *Students are able to determine the proportionality of a function, but do not provide an explanation.* * *Students only partially determine which company might be better under a certain situation, but do not provide proof or justify their response* |
| *1* | * *Students do not provide an equation for each car rental company or provide mostly incorrect equations.* * *NO explanation is provided to explain which company is the best option for the Hendersons’ particular situation and NO reference is made to a graph, table or equation to support their answer.* * *Students do not determine the proportionality of a function, or do so without providing an explanation or referencing the data.* * *Students only mention which company might be better under certain circumstances without any justification or explanation.* |