

TASK 2.2.3: WHAT'S THE NEW RENTAL COST?

You are the manager of jet ski rentals at Lakeland Marina. The owner e-mails you that due to the increase in overhead, the rental cost per jet ski must be increased by \$5 per hour from the old price. You pull out a worn and wet table of prices where some of the pricing information has been smeared so that it is unreadable. You exclaim, "Oh no. What will I do?"

1. Recreate the table of old prices and the corresponding current linear function.

Table of Old Prices

Time	Cost
1	\$50.00
2	65
3	80
4	95
5	110
6	125
7	140
8	155
...	...
n	$15n+35$

Old Function Rule: $c = 15n + 35$

2. Explain how you recreated the table of old prices. Determine the difference in the number of hours the jet ski is rented for \$125 and the number of hours the jet ski is rented for \$80. This difference is 3. Determine the difference of \$125 and \$80, which is \$45. Divide \$45 by 3, thus the cost increases \$15 for each hour rented after the first hour. For each hour less than 3 hours decrease the rental cost by \$15. For each hour more than 3 hours increase the rental cost by \$15.

3. Create a new table of prices and a **New Function I** to guarantee the owner \$5 more per hour for each jet ski.

Table of New Prices

Time	Cost
1	55
2	75
3	95
4	115
5	135
6	155
7	175
8	195
...	...
n	$20n + 35$

New Function Rule I: $c = 20n + 35$

4. How did you use this new information to create the new table? **For each hour the jet ski is rented increase the rental cost in the table of old prices by \$5 in the new table.**
5. What is different about the **Old Function Rule** and the **New Function Rule I**? **The constant rate of change is \$5 more in the New Function Rule I than in the Old Function Rule.**
6. How is that difference reflected in the table? What is this difference called? **The change for each additional hour the jet ski is rented is \$5 more; the new rate per hour is \$20 instead of \$15. This is the rate of change or slope.**
7. What if the owner e-mailed you that, due to increase in overhead, the rental cost per jet ski rental must be increased to \$75 for the first hour and the \$15 per hour remains the same. Predict how this change affects the table and the graph for the **New Function Rule II** compared to the **Old Function Rule**.

Table: The value for the dependent variable that corresponds to 0 for the independent variable is \$60. For each increase in the hours rented the cost increases \$15. For each entry in the table for the independent variable, the value of the dependent variable is \$25.00 more than the corresponding entry in the Old Function Rule.

Graph: The starting point on the graph moves from \$35 to \$50. The rate or slope remains the same, thus the graphs of the two functions are parallel, just shifted up.

8. Create a new table of prices and the **New Function Rule II** for this situation.

New Function Rule II Table

Time	Cost
1	75
2	90
3	105
4	120
5	135
6	150
7	165
8	180
...	...
n	$15n+60$

New Function Rule II: $c = 15n + 60$
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9. Explain how you created the table. The cost for the first hour is \$75. For each additional hour increase the rental cost \$15.00.
10. Identify when you would choose to rent a jet ski using the **New Function Rule I** and when you would use the **New Function Rule II**.

If the jet ski is rented for fewer than 5 hours, then renting it using the New Function Rule I is the better choice.

If the jet ski is rented for more than 5 hours, then renting it using the New Function Rule II is the better choice.

If the jet ski is rented for 5 hours, the cost is the same in both cases.

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1. Recreate the table of old prices and the corresponding current linear function.

Table of Old Prices

Time	Cost
1	
2	
3	80
4	
5	
6	125
7	
8	
...	...
n	

Old Function Rule:

2. Explain how you recreated the table of old prices.

Algebra I: Strand 2. Linear Functions; Topic 2. Formalizing Slope and y-Intercept; Task 2.2.3

3. Create a new table of prices and a **New Function I** to guarantee the owner \$5 more per hour for each jet ski.

Table of New Prices

Time	Cost
1	
2	
3	
4	
5	
6	
7	
8	
...	...
n	

New Function Rule I:

4. How did you use this information to create the new table?
5. What is different about the **Old Function Rule** and the **New Function Rule I**?
6. How is that difference reflected in the table? What is this difference called?
7. What if the owner e-mailed you that due to increase in overhead the rental cost per jet ski rental must be increased to \$75 for the first hour and the \$15 per hour remains the same. Predict how this change affects the table and the graph for the **New Function Rule II** compared to the **Old Function Rule**.

8. Create a new table of prices and the **New Function Rule II** for this situation.

New Function Rule II Table

Time	Cost
1	
2	
3	
4	
5	
6	
7	
8	
...	...
n	

New Function Rule II:

9. Explain how you created the table.
10. Identify when you would choose to rent a jet ski using the **New Function Rule I** and when you would use the **New Function Rule II**.