# Which Garage is Better?

**Student Activity**

Name _____

Class _____

The cost schedules for two different parking garages are below. The maximum stay is 24 hours.

| Blue Street Garage | |
|---|---|
| **Length of time in the garage** | **Cost** |
| 1 hour or less | A flat fee of $10. |
| More than 1 hour | $10 for the first hour plus an additional fee of $5 for every hour after your first hour in the garage. |

| Red Street Garage | |
|---|---|
| **Length of time in the garage** | **Cost** |
| 5 hours or less | $7 per hour |
| More than 5 hours | A flat fee of $35 |

1. Complete the table.

| Length of time in the garage (hours) | Blue Street Garage total cost (dollars) | Red Street Garage total cost (dollars) |
|---|---|---|
| 0 | | |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |

2. Joe parked in the Blue Street Garage and Flo parked in the Red Street Garage for the same length of time. After they checked out and paid, they asked each other which garage was cheaper, only to discover they paid the same amount for their stay. What length of time might each have parked in the garage? What would have been their fee? Use the above table to determine the answers to these two questions. Find all possible answers.
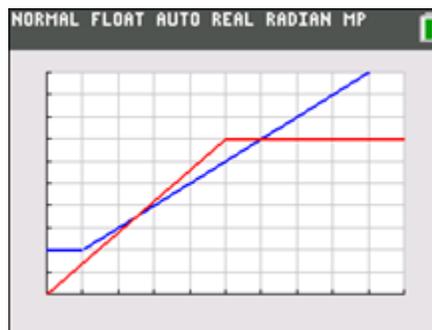
3.  Write the equations of piecewise functions that model the cost of staying in each of the garages.

    Blue Street Garage: $B(x) =$

    Red Street Garage: $R(x) =$

4.  To graph a piecewise function,
    you will need your teacher to lead you
    through this process. Your graph should
    look like the one to the right.
    Graph the functions in the viewing
    window shown.

    NORMAL FLOAT AUTO REAL RADIAN MP

    NORMAL FLOAT AUTO REAL RADIAN MP

    WINDOW
    Xmin=0
    Xmax=10
    Xscl=1
    Ymin=0
    Ymax=50
    Yscl=5
    Xres=1
    △X=.03787878787878
    TraceStep=.07575757575757

5.  When are the costs for using each garage equal to each other? What equations would you set
    equal to each other to find when the costs are equal? Solve these equations below.

6. Use the table, formula, or graph to answer the following. Press [2nd] [GRAPH] for [TABLE]. To examine the intersection on the graph, press [2nd] [TRACE] for [CALC].

   a. Which garage costs less for a short stay? For example, you enter the garage, park, realize you forgot your wallet, and end up having to leave only 15 minutes later.

   b. Suppose after a 2.5-hour movie you decide to go out to a restaurant and stay an additional 2 hours. Which garage will cost less? How much less?

   c. Suppose you needed to park your car for 12 hours in the garage. Which garage will cost less? How much less?

7. Use the graph to solve the equation $B(x) < R(x)$. Interpret the solution in real-world practical terms.
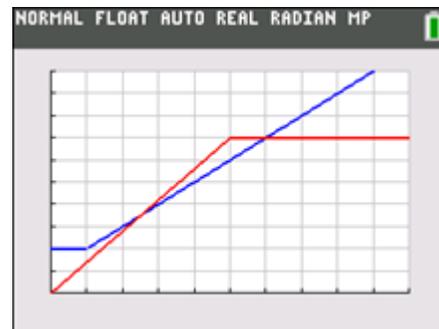


8. Over the length of a day, what duration is the Blue Street Garage better? The Red Street Garage?