

Taxi vs Rideshare

Student Worksheet

7 8 9 10 11 12



TI-30XPlus
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Worksheet



Student



20 min

Gathering the Data

Which option provides the cheaper travel option: Taxi or Rideshare. The answer depends on so many variables, so we explore this problem through the eyes of Rachel who needs to get a ride to and from her house to a friend's party.

Part 1:

Rachel plans to leave for the party late in the afternoon. She checks the taxi fare estimator and finds the following:



Flag Fall: \$4.20

Daytime Rates

Distance Rate: \$1.60

The local ride share company uses the following algorithm to generate a trip price:



Flag Fall: \$9.00

Daytime Rates

Distance Rate: \$1.30

Question: 1.

Using the taxi option, how much will it cost Rachel to travel the following distances:

- i) 10km
- ii) 20km

Question: 2.

Explain why Rachel's 20km trip is not double the price of the 10km trip.

Question: 3.

Using the ride-share option, how much will it cost Rachel to travel the following distances:


- iii) 10km
- iv) 20km

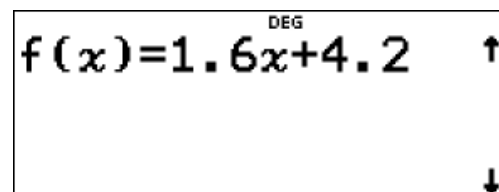
Based on her initial findings, the best solution appears to depend on how far she needs to travel. Rachel decides to explore further using her calculator.

Rachel defines the rule for the taxi fare in $f(x)$:

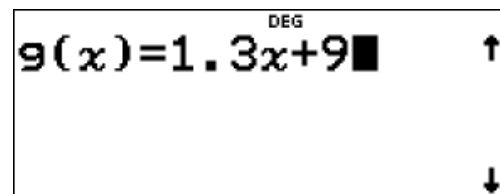


Use:  for the variable x .

Press:  to confirm the taxi rule.


$$f(x) = 1.6x + 4.2$$

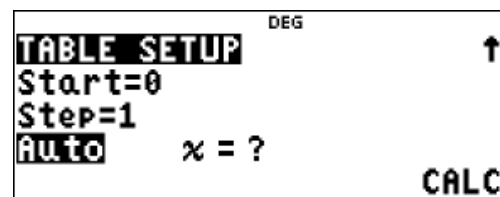
Enter the rule for the ride-share option in $g(x)$.



Match the table setup options shown opposite and proceed to the table by selecting **CALC** (bottom right of screen).

Use the navigation keys to move up or down through the list.

Check your answers for Questions 1 & 3 for the travel costs for the taxi and ride-share options.



Note: Taxi fares also include a wait time calculator which means if you get stuck in traffic the meter continues to run, typically \$0.50 per minute. In comparison, ride-share companies include a surge fee which increases prices depending on the time of day, availability of drivers and the corresponding demand for rides.

Question: 4.

If the party is 18km from Rachel's house, which is the cheapest option: taxi or ride-share?

Question: 5.

Scroll through the list and determine the distance where the taxi and ride-share options are the same.

Question: 6.

Use algebra to show that the answer to Question 5 is correct.

Part 2:

Rachel plans to leave the party around midnight. At this time of day, prices for taxis and ride-share options are different.



Flag Fall: \$5.20

Evening Rates

Distance Rate: \$1.60

The local ride share company uses the following algorithm to generate a trip price:



Flag Fall: \$12.00

Evening Rates

Distance Rate: \$1.30

Question: 7.

Use your calculator to estimate the distance where taxis and ride-share options are the same price.

Question: 8.

Use algebra to determine the 'exact' distance where taxis and ride-share options are the same price.

Question: 9.

Taxi fares also include a wait time fee, typically \$0.50 per minute, so if you get stuck in traffic the fare may go up considerably. Ride-share prices also vary based on demand and driver availability, essentially becoming an auction, this is referred to as 'surging'. If Rachel wants to use the same service (taxi or ride-share) to and from the party, discuss which might be the best option taking all the information into consideration.