

Math Activity: Cost of Water

Student Sheet

Directions: Use the information from the BR Water Company's website to answer the following questions. <http://brwater.com/schedule/baton-rouge-water-company.html>

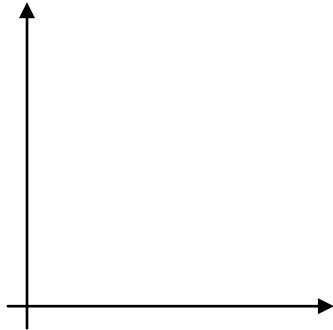
1. What unit of measure is water billed by?
2. Fill in the monthly cost below given the number of cubic feet of water used a month.

Cubic feet	Monthly cost
100	
200	
300	
400	
500	
600	

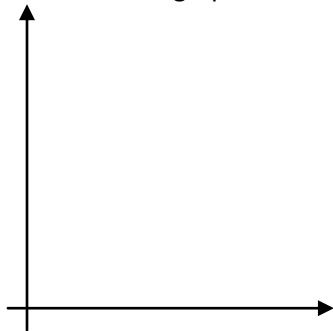
3. When did the rate change in the table above and how did it change?
4. Write an equation that shows the cost before the change, described in number 3.
5. Write an equation that shows the cost after the change, described in number 3.
6. What would be the monthly cost be for 20,000 cubic feet? Write an expression and solve.
7. According to the rate chart, at what cubic feet would the rate change again?
8. What would the monthly cost be for 30,000 cubic feet? Write an expression and solve.
9. How many cubic feet would you have used if your bill was \$54.61?

10. Can the monthly rate for water use be represented by a linear situation?

11. Draw a sketch of the graph showing water use from 0 to 300 cubic feet.



12. Draw a sketch of the graph showing water use from 400 to 19,700 cubic feet.



13. Does the monthly rate for water used represent a function? Why or why not?

14. What unit of measure is water billed by for Ascension Water Company?

15. Which district has cheaper cost of water? Explain your reasoning. (1 cubic feet = 7.48052 gallons)

Math Activity: Cost of Water

ANSWER KEY

Directions: Use the information from the BR Water Company's website to answer the following questions. <http://brwater.com/schedule/baton-rouge-water-company.html>

1. What unit of measure is water billed by?

Hundred cubic feet

2. Fill in the monthly cost below given the number of cubic feet of water used a month.

Cubic feet	Monthly cost
100	\$8.52
200	\$8.52
300	\$8.52
400	\$9.73
500	\$10.95
600	\$12.16

3. When did the rate change in the table above and how did it change?

The rate change at 400 cubic feet. The first 300 cubic feet were \$8.52. Afterwards, the rates were an additional \$1.213.

4. Write an equation that shows the cost before the change, described in number 3.

$y = 8.52$

5. Write an equation that shows the cost after the change, described in number 3.

$y = 8.52 + 1.213x$ where x is the number of hundred cubic feet after 300 or

$y = 8.52 + 1.213(x - 3)$ where x is the number of hundred cubic feet

6. What would be the monthly cost be for 20,000 cubic feet? Write an expression and solve.

$2.84(3) + 1.213(197) = \$247.48$

7. According to the rate chart, at what cubic feet would the rate change again?

The rate would change at 201 hundred cubic feet or 20,100 cubic feet.

8. What would the monthly cost be for 30,000 cubic feet? Write an expression and solve.

$2.84(3) + 1.213(197) + 0.737(100) = \321.18

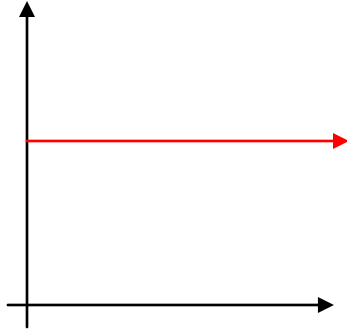
9. How many cubic feet would you have used if your bill was \$54.61?

41 hundred cubic feet or 4,100 cubic feet

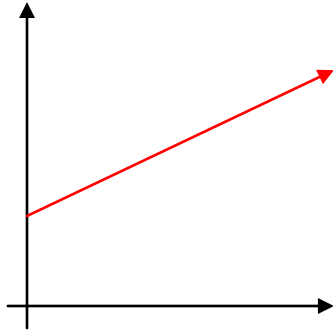
10. Can the monthly rate for water use be represented by a linear situation?

The overall monthly rate cannot be represented as a linear situation, but parts of the equation can be linear.

11. Draw a sketch of the graph showing water use from 0 to 300 cubic feet.



12. Draw a sketch of the graph showing water use from 400 to 19,700 cubic feet.



13. Does the monthly rate for water used represent a function? Why or why not?

Yes, it does represent a function since every input has only one output.

14. What unit of measure is water billed by for Ascension Water Company?

Gallons

15. Which district has cheaper cost of water? Explain your reasoning. (1 cubic feet = 7.48052 gallons)

Baton Rouge water is cheaper.

300 cubic feet is approximately over 2,000 gallons. For Baton Rouge, this would cost \$8.52. For Ascension, this would cost \$10.69.

After 300 cubic feet, the rates are \$1.213 per 100 cubic feet for Baton Rouge. For Ascension, the rates are \$2.84 per 1,000 gallons or 133.7 cubic feet.

Since $1.213/100 < 2.84/133.7$, Baton Rouge continued rate is still cheaper.



<http://brwater.com/schedule/baton-rouge-water-company.html>

Schedule of Rates & Tariffs

Baton Rouge Water Company
Baton Rouge, Louisiana
Issued: December 19, 2013

Monthly Minimum Charge

Size of Meter

- 5/8" - \$8.52
- 3/4" - \$13.37
- 1" - \$23.08
- 1 1/2" - \$48.55
- 2" - \$78.87
- 3" - \$148.02
- 4" - \$248.22
- 6" - \$491.43
- 8" - \$975.64
- 10" - \$2818.87

The minimum charge applicable to meter banks (two or more meters on one service line) shall be that which would be billed under the above schedule for a single meter having nearest equivalent capacity.

Monthly Rates for Water Used Per 100 Cubic Feet

- First 3 hundred cu. ft. \$2.84
- Next 197 hundred cu. ft. \$1.213
- Additional hundred cu. ft. \$0.737

Schedule of Rates & Tariffs

Ascension Water Company
Ascension Parish, Louisiana
Issued: February 29, 2012

Availability

This service is available under the general terms and conditions of the Company to all customers of water service within area served by the Company.

Monthly Minimum Charge

Size of Meter

- 5/8" - \$13.36
- 3/4" - 19.04
- 1" - 33.24
- 1 1/2" - 67.32
- 2" - 107.08
- 3" - 200.80
- 4" - 470.60
- 6" - 1,072.68
- 8" - 1,876.40
- 10" - 3,591.76

Monthly Rates for Water Used Per 1,000 Gallons

- First 2,500 gallons \$5.344 per 1,000 gallons
- All Additional \$2.84 per 1,000 gallons