BLACKSTONE CANAL

Name: _____

Class: _____ Date: _____

Math Exercise 1 of 5

Tolls

Assuming no special rates for item discounts, tolls for usage were 3 cents per ton per mile. The distance of travel was 45 miles.

Year	1828	1829	1830	1831	1832	1834	1836
Total Tolls Collected	1,000.00	8,606.00	12,016.82	14,944.67	18,907.45	17,545	11,500

1. Using the canal saved $4.00 per ton compared to land travel for goods like grain, farm tools, molasses, tobacco, and clothing. If 1019 tons of goods were shipped at 3 cents per ton from Providence, RI to Worcester, MA, how much was saved by using the canal?

2. How many tons of goods were transported in each of the years represented in the table?

3. What is the total increase in tolls collected from 1828 to 1832?

4. From 1828 to 1832, determine the average and median tolls collected for usage of the canal.

5. Create a line graph to represent the data from the table.

6. It was estimated that the total amount of tolls received from 1828 –1848 was $125,000. The total cost of the construction of the canal was $750,000. There were approximately 30 shareholders in the company. What was the total loss per shareholder.

7. What solutions could you have for these shareholders to earn more money?

_____

What are the pros and cons of your ideas? _____

_____

8. How would each of your ideas impact Worcester? _____

_____

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Math Exercise 2 of 5

Volume

The 49 locks used in the canal were 9 1/2 feet deep x 10 feet wide by 94 feet long, with 82 feet between gates.

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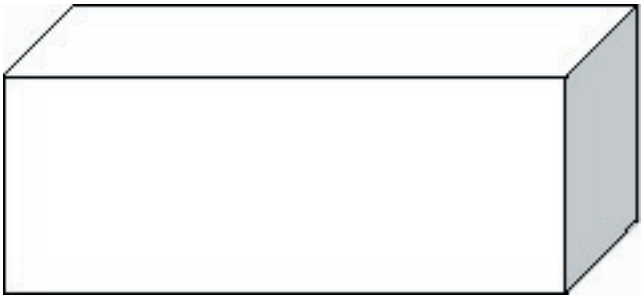

1. Find the volume of water held between the gates. (LxWxH)

2. Find the surface area of water exposed. (LxW of top rectangle)

3. How many gallons of water is contained in the gate? (use 9.6 gal = 1ft)

4. If water weighs 62.4lbs per cubic foot, what is the weight of the water held between gates?

5. The grade/width of the canal changes from 34’ at the top to 18’ at the bottom. What is the percent change from top to bottom?

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Math Exercise 3 of 5

Measuring the percentage change of the Blackstone Canal's effect on Worcester

Population of Worcester, 1765-1840:
Before and after building the Blackstone Canal

Year	Population
1765	1,475
1775	1,925
1790	1,950
1800	2,350
1810	2,500
1820	2,962
1825	3,650
1830	4,172
1835	6,624
1840	7,497

1. Using the data from the table above, create a bar graph to show the increase in population.

2. Calculate the percentage change in Worcester's population and complete the chart.

Year	Population	Increase	Percent of Increase
1765	1,475		
1775	1,925	450	30.51%
1790			
1800			
1810			
1820			
1825			
1830			
1835			
1840			

3. Canal Construction began in 1824. What assumptions can you make on the canal's effect on Worcester's population?

BLACKSTONE CANAL

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Math Exercise 4 of 5

1829 Toll Charge for imports and exports

Type	Charge
Building Material	14 cents per 100 lbs
Plaster	12 ½ cents per 100 lbs
Cask of Lime	36 cents per 400 lbs
Flour	30 cents per barrel (214 lbs)

2,000 pounds = 1 ton

1. What would the charge be for the builder to ship 3 tons of lumber, 8 tons of marble, 150 pounds of nails, and 3 tons of plaster be?

2. What would the charge be for a builder to ship 5 barrels of flour and 5 tons of lime?

3. What is the effect of importing and exporting these goods? (use maps as a resoure) _____

_____

Boats were built to a maximum of 70 feet in length, minimum of 45 feet long, most hauled freight and charged ½ cent per mile; passenger toll were set at 15 cents per mile

1. Assuming no freight was on the Salisbury canal boat, what would be the typical charge for it to go from Worcester, MA to Providence RI?

2. If the Lady Carrington canal boat carried 27 people from Providence, RI to Worcester, MA, what would be the total amount of tolls that John Davis would have to pay?

3. Do you think the canal was better used to carry goods or people? Give three reasons in your answer. _____

_____

4. What type of impact would your decision have had on Worcester? _____

_____

_____

BLACKSTONE CANAL

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Math Exercise 5 of 5

1850 U.S. Population Census

	Whites			Free Colored			Aggregate Pop
	M	F	Total	M	F	Total	
Born in U.S.	333,492	346,133	679,625	2,719	2,980	5,699	**685,324**
Born out of U.S.	67,511	71,908	139,419	1,348	1,339	2,687	**142,106**
Born Foreign Country	81,129	82,469	163,598	232	194	426	**164,024**
Unknown	1,961	847	2,808	125	127	252	**3,060**
Total	**484,093**	**501,357**	**985,450**	**4,424**	**4,640**	**9,064**	**994,514**

Worcester Population 1850 - 17,049

1. Construct a circle graph showing the total population for whites in the four categories shown.

2. What is the angle measurement of whites born foreign country?

3. What percentage of the graph represents those whites born out of U.S.?

4. Construct a circle graph showing the total population for free colored in the four categories shown.

5. What is the angle measurement of free colored born foreign country?

6. What percentage of the graph represents those free colored born out of U.S.?

What if any comparisons can be made using the two pie graphs regarding the population in the United States and in Worcester? _____

_____

_____

_____