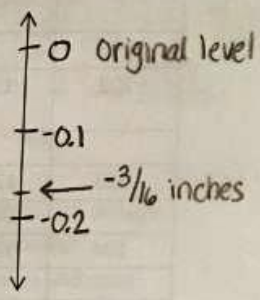
Name: Key Date: _____

End-of-Module 2 STUDY GUIDE

Directions: Show all work for full credit.

1. The water level in Lums Pond changes at an average of -3/8 inches every 2 years.
   a. Based on the rate above, how much will the water level change after one year? Show your calculations and model your answer on the vertical number line, using 0 as the original water level.

$$\frac{-3}{8} \div 2 = \frac{-3}{8} \times \frac{1}{2} = \frac{-3}{16}$$



   b. How much would the water level change over a 5-year period?

$$\frac{-3}{16} \times 5 = \frac{-15}{16}$$

The water level drops 15/16 inches over a 5 year period.

   c. When written in decimal form, is your answer to part (b) a repeating decimal or a terminating decimal? Justify your answer using long division.

$$16 \overline{)\,15.0000} = 0.9375$$

-0
150
-144
60
-48
120
-112
80

$\frac{5}{16} \times 9 = 144$ $\quad \frac{4}{16} \times 7 = 112$

It is a terminating decimal because it ends, and does not continue or repeat after the 5.

2. Tenley received a letter from her bank saying that her checking account balance fell below zero. Her account transaction log is shown below.

Check No.	Date	Description of Transaction	Payment	Deposit	Balance	
---	12/7	Beginning Balance	---	---	$905.50	
101	12/8	Sullivan's Jewelry (Necklace)	89.00		-89.00	
					816.50	Line 1
102	12/9	DE Sport (Running shoes)	65.50		-65.50	
					751.00	Line 2
103	12/15	Homes 'R Us (Desk)	251.00		-251.00	
					500.00	Line 3
104	12/20	Horizon (Phone)	510.00		-510.00	
				-10	10.00	Line 4
	12/26	Cash Deposit (Birthday)	25.00 →		+25.00	
				15	35.00	Line 5
Debit Card	12/26	Pizza Time	9.95		-9.95	
				5.05	25.05	Line 6

a. On which line did Tenley make a mathematical error? Explain Tenley's mistake.

Line 4 $500-$510 = -$10 not $10

When you subtract a larger number from a smaller number you would get a negative number.

b. The bank charged Tenley a $30 fee because her balance dropped below $0. She knows that she currently has an outstanding charge for $19.75 that she has not yet recorded. How much money will Tenley have to deposit into her account so that the outstanding charge does not create another bank fee? Explain.

5.05 - 19.75 - 30 = -44.70

$44.70 or more would have to be deposited

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3. Rebecca decided to make handmade cards to sell at a craft fair. Rebecca rented a table at the fair for $50 and set up her display. Each card that she makes costs approximately $1.50 for materials. She sells each card for $5.00.

   a. If x represents the number of cards sold at the craft fair, which of the following expressions would represent Rebecca's profit? [Circle all choices that apply]

   (A.) -50 + 5x – 1.50x
   B. 5x – 50
   (C.) 3.50x – 50
   (D.) 5x – 50 – 1.50x
   E. 4.50x – 50

Net profit per card = 5.00 - 1.50 = $3.50/card

Profit = -50 + 3.50x (x = # of cards)

   b. Rebecca does not want to lose money on her business. She needs to sell enough cards to at least cover her expenses (costs for materials and table rental). Rebecca figures that if she sells 20 cards, she will cover her expenses and does not lose any money. Do you agree? Explain and show work to support your answer.

$-50 + 3.50(20) \stackrel{?}{\geq} 0$

$20 \geq 0$

Yes, she will make a total of $20 if she sells 20 cards

   c. Rebecca feels that if she earns a profit of $45 at this craft fair, her business will be successful enough for her to branch out to other craft fairs. How many cards does she have to sell to earn a $45 profit? Write and solve an equation, then explain how the steps and operations used in your algebraic solution compare to an arithmetic solution. Let x = # of cards sold

$-50 + 3.50x = 45$
$+50 \quad +50$

$\frac{3.50x}{3.50} = \frac{95}{3.50}$

$x = 27.14$

She would need to sell 28 cards to make at least $45 profit. To find the answer arithemetically, combine $45 profit and rental fee ($50) + divide that sum ($95) by 3.50 per card

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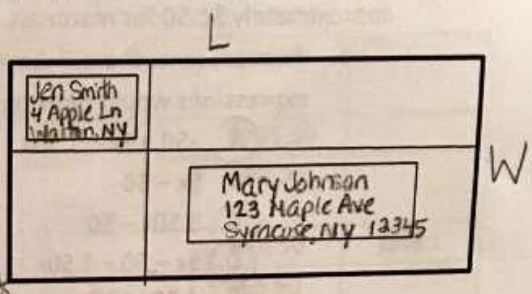
4. The length of a rectangular envelope is 1 ½ times its width. A piece of string surrounds the entire envelope to secure it as shown in the picture. The string is 20 ¼ inches long. Find the length and width of the envelope.

L = length = 1.5W

W = width



Front Back Front Back

$1\frac{1}{2}W + 1\frac{1}{2}W + W + W = 20\frac{1}{4}$

OR $1.5W + 1.5W + W + W = 20.25$

$3W + 2W = 20.25$

$\frac{5W}{5} = \frac{20.25}{5}$

$W = 4.05$ in or $W = 4\frac{1}{20}$ in

$L = 1.5W = 1.5(4.05) = 6.075$

$L = 6.075$ in or $L = 6\frac{3}{40}$ in

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5. Jose and Richard are playing the Integer Card Game. The cards in their hands are shown below:

Jose's Hand	Richard's Hand
5, 1, -8, 11	-4, -7, 5, 4

a. What are the scores in each of their hands? Show your work.

Jose's score: $5+1+(-8)+11=9$

$6+3$

Richard's score: $-4+(-7)+5+4=-2$

$-11 \quad 9$

b. Krista says that if Jose and Richard both take away their 5's, Jose's score will be higher than Richard's. Michael argues and says that Jose's and Richard's scores will be equal. Are either of them right? Explain.

Jose: $1+(-8)+11=4$

Richard: $-4+(-7)+4=-7$

Krista is correct; since Jose had the higher score to begin with, if they both discard the same value card, the scores will both change by the same amount.

c. Jose picks up another set of cards that is exactly like each card in his hand. Which of the following would make Richard's score equal to Jose's? Place a check mark by all that apply.

_____ Double every card in his hand
_____ Take away his -7 and 5
_____ Take away his 4 and -4
✓ Pick up a 20
✓ Pick up a 12 and 8
_____ Pick up one of each of Jose's cards

Jose's new score will be $9+9=18$

Richard's score would have to increase from -2 to 18

Explain why your selection will make Jose's and Richard's scores equal.

Jose's total doubles because every card in his hand doubled, so his total is 18. Each choice I selected would add 20 to Richard's total.