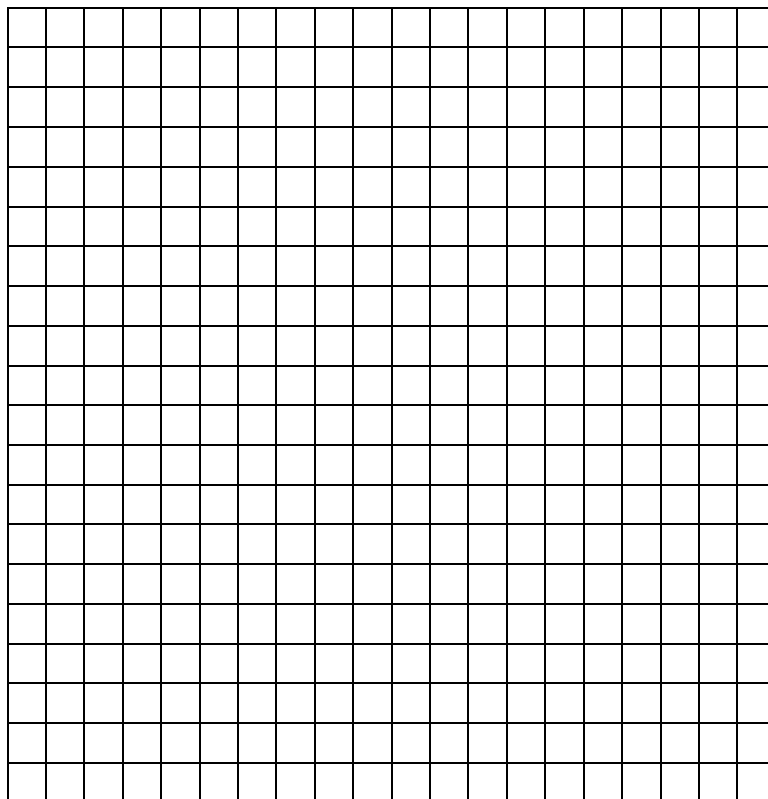


Name \_\_\_\_\_

Date \_\_\_\_\_

1. In New York, state sales tax rates vary by county. In Allegany County, the sales tax rate is  $8\frac{1}{2}\%$ .
  - a. A book costs \$12.99, and a video game costs \$39.99. Rounded to the nearest cent, how much more is the tax on the video game than the tax on the book?
  - b. Using  $n$  to represent the cost of an item in dollars before tax and  $t$  to represent the amount of sales tax in dollars for that item, write an equation to show the relationship between  $n$  and  $t$ .
  - c. Using your equation, create a table that includes five possible pairs of solutions to the equation. Label each column appropriately.

- d. Graph the relationship from parts (b) and (c) in the coordinate plane. Include a title and appropriate scales and labels for both axes.



- e. Is the relationship proportional? Why or why not? If so, what is the constant of proportionality? Explain.

- f. In nearby Wyoming County, the sales tax rate is 8%. If you were to create an equation, graph, and table for this tax rate (similar to parts (b), (c), and (d) above), what would the points  $(0, 0)$  and  $(1, 0.08)$  represent? Explain their meaning in the context of this situation.
- g. A customer returns an item to a toy store in Wyoming County. The toy store has another location in Allegany County, and the customer shops at both locations. The customer's receipt shows \$2.12 tax was charged on a \$24.99 item. Was the item purchased at the Wyoming County store or the Allegany County store? Explain and justify your answer by showing your math work.

2. Amy is baking her famous pies to sell at the Town Fall Festival. She uses  $32\frac{1}{2}$  cups of flour for every 10 cups of sugar in order to make a dozen pies. Answer the following questions below and show your work.
- Write an equation, in terms of  $f$ , representing the relationship between the number of cups of flour used and the number of cups of sugar used to make the pies.
  - Write the constant of proportionality as a percent. Explain what it means in the context of this situation.
  - To help sell more pies at the festival, Amy set the price for one pie at 40% less than what it would cost at her bakery. At the festival, she posts a sign that reads, “Amy’s Famous Pies—Only \$9.00/Pie!” Using this information, what is the price of one pie at the bakery?

A Progression Toward Mastery					
Assessment Task Item		STEP 1 Missing or incorrect answer and little evidence of reasoning or application of mathematics to solve the problem.	STEP 2 Missing or incorrect answer but evidence of some reasoning or application of mathematics to solve the problem.	STEP 3 A correct answer with some evidence of reasoning or application of mathematics to solve the problem, <u>or</u> an incorrect answer with substantial evidence of solid reasoning or application of mathematics to solve the problem.	STEP 4 A correct answer supported by substantial evidence of solid reasoning or application of mathematics to solve the problem.
1	a  7.RP.A.3 7.EE.B.3	Student is not able to compute the tax for either item correctly.	Student computes the tax rate for only one of the items correctly. <u>OR</u> Student computes both taxes correctly but does not subtract the two tax values or does it incorrectly.	Student computes both taxes and subtracts the two tax values correctly but fails to round the difference to the nearest cent. <u>OR</u> Student computes both taxes and subtracts the two tax values correctly with only one minor error in rounding the difference to the nearest cent.	Student computes both taxes and subtracts the two tax values correctly and correctly rounds the difference to the nearest cent.
	b  7.RP.A.2	Student does not attempt to answer the question.	Student has the incorrect answer, writing an expression such as $0.85n$ .	Student has the incorrect answer but makes an attempt to write an equation. For example, the student incorrectly writes $t = 0.85n$ .	Student has the correct answer: $t = 0.085n$ .
	c  7.RP.A.2	Student attempts to answer the question but does not construct a table or only provides one point. <u>OR</u> Student does not attempt to answer the question.	Student has the incorrect answer but makes an attempt to construct a table. Fewer than four correct points are listed.	Student correctly calculates and lists five points, but the table is not labeled correctly. <u>OR</u> Student correctly calculates and lists four of the five points and correctly labels the table.	Student has a correct table (with labeling), including five points that show the cost of the item as the independent variable and the amount of sales tax as the dependent variable. The student shows significant evidence of application of mathematics by multiplying each cost by 0.085 to get the amount of sales tax.

<p><b>d</b></p> <p><b>7.RP.A.2</b> <b>7.RP.A.3</b></p>	<p>Student makes an attempt to construct a graph, but the graph is incomplete, missing several components. <u>OR</u> Student does not attempt to answer the question.</p>	<p>Student constructs a graph that shows some evidence of understanding the proportional relationship, but the graph contains multiple errors. For example, the scale is incorrect, the axes are not labeled, the line is not straight, etc.</p>	<p>Student constructs a correct graph and uses an appropriate scale on each axis but does not label the axes or provide a title for the graph. <u>OR</u> Student constructs a correct graph with one minor error but provides a title for the graph and labels the axes correctly.</p>	<p>Student constructs a correct graph (with labeling, scale, and title), showing a straight line through the origin. (Scales may vary.) The cost of the item is graphed along the <math>x</math>-axis, and the amount of sales is graphed along the <math>y</math>-axis.</p>
<p><b>e</b></p> <p><b>7.RP.A.2</b></p>	<p>Student may or may not state that the relationship is proportional and provides little or no evidence of reasoning. <u>OR</u> Student does not attempt to answer the question.</p>	<p>Student incorrectly states that the relationship is not proportional but provides an explanation that demonstrates some understanding of proportional relationships. Student may or may not identify a correct constant of proportionality. <u>OR</u> Student correctly identifies the relationship as proportional but states an incorrect constant of proportionality.</p>	<p>Student correctly states that the relationship is proportional but provides an incomplete explanation to support the claim. For example, student only includes “because the graph is a straight line” and does not state that it touches the origin. Student correctly identifies the constant of proportionality but may or may not explain its meaning. <u>OR</u> Student states the relationship is proportional but bases the answer on an incorrect graph from part (c). The constant of proportionality stated is based on the incorrect graph.</p>	<p>Student correctly states that the relationship is proportional and provides a thorough explanation which includes the following: (1) the graph is a straight line that touches the origin, and (2) all the ratios of sales tax to cost equal 0.085. Student correctly identifies the constant of proportionality and explains its meaning as the unit rate, identifying 0.085 as the amount of sales tax per dollar.</p>
<p><b>f</b></p> <p><b>7.RP.A.1</b> <b>7.RP.A.2</b></p>	<p>Student does not attempt to answer the question.</p>	<p>Student incorrectly explains what (0,0) and (1, 0.08) mean in the context of the situation but provides some evidence of reasoning.</p>	<p>Student shows solid evidence of reasoning in the explanation, but the answer is not complete. For example, the student explains that (1, 0.08) represents the unit rate and that (0,0) is the point where there are zero dollars spent, so no tax is charged; however, student does not relate both points to the context of the situation.</p>	<p>Student correctly explains what both points (0, 0) and (1, 0.08) mean in the context of the situation. The explanation includes evidence of solid reasoning. For example, (0, 0) shows nothing was purchased, so no tax has been applied, and (1, 0.08) shows the unit rate, meaning for every increase of \$1.00, the amount of tax will increase by \$0.08.</p>

	<b>g</b> <b>7.RP.A.3</b> <b>7.EE.B.3</b>	Student may or may not answer Allegany County and provides little or no evidence of reasoning. <u>OR</u> Student does not attempt to answer the question.	Student does not have the correct answer of Allegany County but supports the answer with some evidence of reasoning. Multiple errors are made in the calculations to find the tax rate.	Student has the correct answer of Allegany County, but the math work or explanation is slightly incomplete or contains a minor error.	Student has the correct answer of Allegany County and supports the answer with a valid explanation and correct math work (or uses estimation) to show that the tax rate is about 8.5%.
<b>2</b>	<b>a</b> <b>7.RP.A.1</b> <b>7.RP.A.2</b>	Student does not attempt to answer the question.	Student writes an equation involving $f$ and $s$ , but the equation is incorrect and shows little evidence of understanding.	Student writes an equation involving $f$ and $s$ , and although the equation is incorrect, it demonstrates an understanding of the proportional relationship. For instance, the student writes the equation in terms of $s$ , such as $s = \frac{1}{3.25}f$ .	Student writes a correct equation in terms of $f$ , such as $f = 3\frac{1}{4}s$ , or $f = 3.25s$ , or $f = \frac{13}{4}s$ . Student shows substantial evidence of understanding by dividing 32.5 by 10 to find the constant of proportionality.
	<b>b</b> <b>7.RP.A.2</b>	Student answers incorrectly and shows little or no evidence of understanding how to convert a fraction or decimal to a percent. <u>OR</u> Student does not attempt to answer the question.	Student answers incorrectly, but the math work and/or explanation shows some evidence of understanding how to convert a fraction or decimal to a percent. The student may or may not have correctly explained what the constant of proportionality means in the context of the situation.	Student correctly answers 325%, but the explanation and/or supporting work is not complete.	Student correctly answers 325% with adequate work shown <u>AND</u> correctly explains that the amount of flour used is 325% of the amount of sugar used.
	<b>c</b> <b>7.RP.A.3</b> <b>7.EE.B.3</b>	Student states an incorrect price for the pie and shows little or no relevant work to support the answer. <u>OR</u> Student does not attempt to answer the question.	Student states an incorrect price for the pie, but the math work shows a partial understanding of the task involved.	Student states the correct price of \$15 per pie at the bakery, but the supporting math work is incomplete or contains a minor error. <u>OR</u> Student states an incorrect price for the pie, but the answer is based on sound mathematical work that contains a minor error.	Student states the correct price of \$15 per pie at the bakery and supports the answer with math work that indicates solid reasoning and correct calculations. For instance, the student may write and solve an equation such as $9 = (1 - 0.40)x$ .

Name \_\_\_\_\_

Date \_\_\_\_\_

1. In New York, state sales tax rates vary by county. In Allegany County, the sales tax rate is  $8\frac{1}{2}\%$ .
- a. A book costs \$12.99 and a video game costs \$39.99. Rounded to the nearest cent, how much more is the tax on the video game than the tax on the book?

$$12.99(8.5\%) = 12.99(0.085) = 1.10415$$

$$39.99(8.5\%) = 39.99(0.085) = 3.39915$$

$$3.39915 - 1.10415 = 2.295$$

Answer: \$2.30

- b. Using  $n$  to represent the cost of an item in dollars before tax and  $t$  to represent the amount of sales tax in dollars for that item, write an equation to show the relationship between  $n$  and  $t$ .

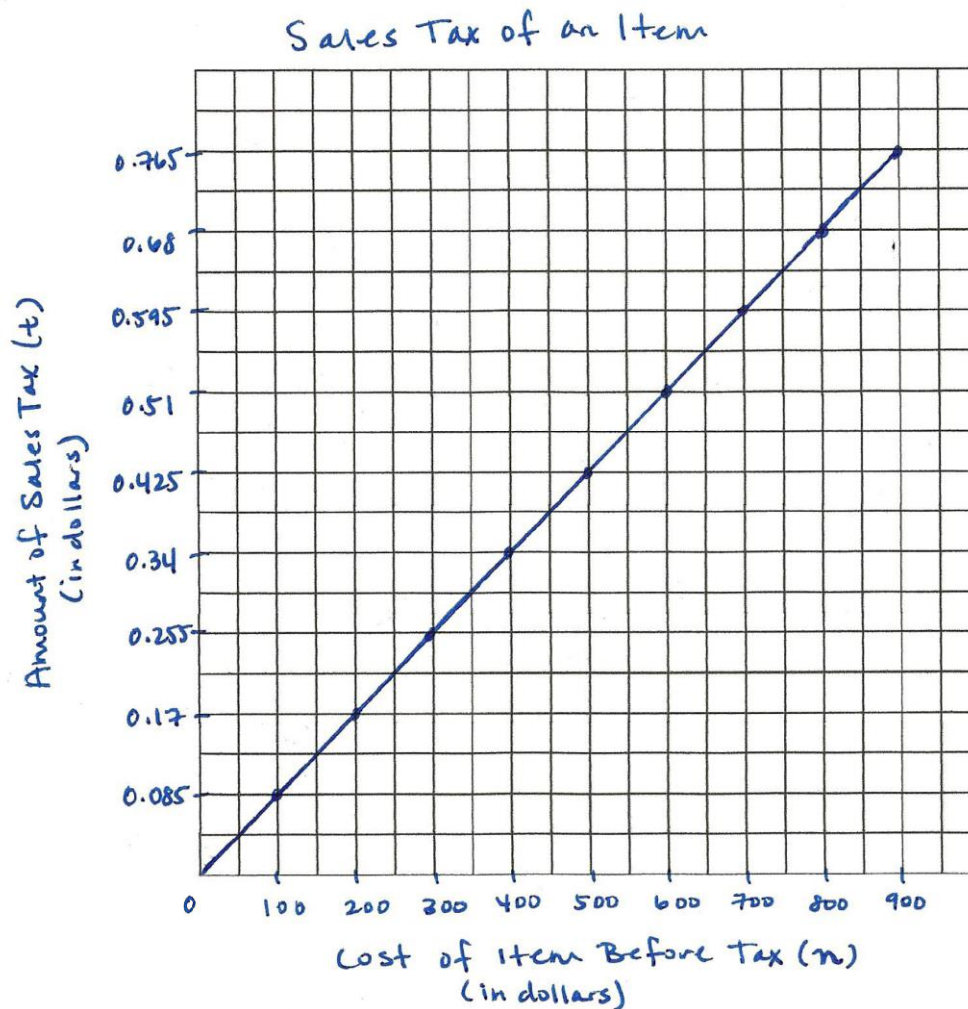
$$t = 0.085n$$

- c. Using your equation, create a table that includes five possible pairs of solutions to the equation. Label each column appropriately.

Cost of Item ( $n$ )	Amount of Sales Tax ( $t$ )		
0	0.00		
1.00	0.085		
2.00	0.17	$\begin{array}{r} 0.085 \\ \times 2 \\ \hline 0.17 \end{array}$	$\begin{array}{r} 0.085 \\ \times 4 \\ \hline 0.340 \end{array}$
3.00	0.255	$\begin{array}{r} 0.085 \\ \times 3 \\ \hline 0.255 \end{array}$	$\begin{array}{r} 0.085 \\ \times 5 \\ \hline 0.425 \end{array}$
4.00	0.34		
5.00	0.425	$\begin{array}{r} 0.085 \\ \times 6 \\ \hline 0.510 \end{array}$	$\begin{array}{r} 0.085 \\ \times 7 \\ \hline 0.595 \end{array}$
			$\begin{array}{r} 0.085 \\ \times 8 \\ \hline 0.680 \end{array}$



- d. Graph the relationship from parts (b) and (c) in the coordinate plane. Include a title and appropriate scales and labels for both axes.



- e. Is the relationship proportional? Why or why not? If so, what is the constant of proportionality? Explain.

Yes, the relationship is proportional because the graph of the equation is a straight line that touches the origin. Also, the table shows that the ratios of the amount of sales tax equal 0.085.

*cost of an item*

$$\frac{0.085}{1} = \frac{0.17}{2} = \frac{0.255}{3} = \frac{0.34}{4} = \frac{0.425}{5}$$

The constant of proportionality is 0.085 because that is the sales tax amount for \$1.00, which is the unit rate.

- f. In nearby Wyoming County, the sales tax rate is 8%. If you were to create an equation, graph, and table for this tax rate (similar to parts (b), (c), and (d) above), what would the points  $(0, 0)$  and  $(1, 0.08)$  represent? Explain their meaning in the context of this situation.

The point  $(0, 0)$ <sup>origin</sup> means that no tax has been applied yet because nothing has been purchased. The point  $(1, 0.08)$  is the unit rate, or the constant of proportionality. It means that for an item that costs \$1.00, the amount of tax applied is \$0.08. The unit rate also shows that for every \$1.00, the amount of tax will increase by \$0.08.

- g. A customer returns an item to a toy store in Wyoming County. The toy store has another location in Allegany County, and the customer shops at both locations. The customer's receipt shows \$2.12 tax was charged on a \$24.99 item. Was the item purchased at the Wyoming County store or the Allegany County store? Explain and justify your answer by showing your math work.

The item was purchased in Allegany County.

$$\frac{2.12}{24.99} \text{ is about } \frac{2.12 \times 4}{25 \times 4} = \frac{8.48}{100},$$

which is 8.48%, or about 8.5%.

2. Amy is baking her famous pies to sell at the Town Fall Festival. She uses  $32\frac{1}{2}$  cups of flour for every 10 cups of sugar in order to make a dozen pies. Answer the following questions below and show your work.
- a. Write an equation, in terms of  $f$ , representing the relationship between the number of cups of flour used and the number of cups of sugar used to make the pies.

$$f = \frac{13}{4}s$$

$$\frac{32\frac{1}{2} \text{ cups flour}}{10 \text{ cups sugar}} = \frac{32.5}{10} = 3.25 = 3\frac{1}{4} = \frac{13}{4}$$

- b. Write the constant of proportionality as a percent. Explain what it means in the context of this situation.

$$3.25 = \frac{325}{100} = 325\%$$

A constant of proportionality of 325% means that the amount of flour used to make the pies is 325% the amount of sugar used.

- c. To help sell more pies at the festival, Amy set the price for one pie at 40% less than what it would cost at her bakery. At the festival, she posts a sign that reads, "Amy's Famous Pies—Only \$9.00/Pie!" Using this information, what is the price of one pie at the bakery?

$$x - 0.4x = 9$$

$$\frac{0.6x}{0.6} = \frac{9}{0.6}$$

$$x = 15$$

$$\begin{array}{r} 15.00 \\ 0.6 \overline{) 9.0} \\ \underline{-6} \phantom{00} \\ 30 \phantom{00} \\ \underline{-30} \phantom{00} \\ 0 \phantom{00} \end{array}$$

The price of one pie at the bakery is \$15.00.