Name _____   Date _____

1. Jasmine has taken an online boating safety course and is now completing her end of course exam. As she answers each question, the progress bar at the bottom of the screen shows what portion of the test she has finished. She has just completed question 16 and the progress bar shows she is 20% complete. How many total questions are on the test? Use a table, diagram, or equation to justify your answer.

2. Alisa hopes to play beach volleyball in the Olympics someday. She has convinced her parents to allow her to set up a beach volleyball court in their back yard. A standard beach volleyball court is approximately 26 feet by 52 feet. She figures that she will need the sand to be one foot deep. She goes to the hardware store to shop for sand and sees the following signs on pallets containing bags of sand.

    a.   What is the rate that Brand A is selling for? Give the rate and then specify the unit rate.

b. Which brand is offering the better value? Explain your answer.

c. Alisa uses her cell phone to search how many pounds of sand is required to fill 1 cubic foot and finds the answer is 100 pounds. Choose one of the brands and compute how much it will cost Alisa to purchase enough sand to fill the court. Identify which brand was chosen as part of your answer.

3. Loren and Julie have different part time jobs after school. They are both paid at a constant rate of dollars per hour. The tables below show Loren and Julie's total income (amount earned) for working a given amount of time.

Loren

Hours	2	4	6	8	10	12	14	16	18
Dollars	18	36	54	72	90	108			162

Julie

Hours	3	6	9	12	15	18	21	24	27
Dollars	36		108	144	180	216		288	324

a. Find the missing values in the two tables above.

b. Who makes more per hour? Justify your answer.

c. Write how much Julie makes as a rate. What is the unit rate?

d.   How much money would Julie earn for working 16 hours?

e.   What is the ratio between how much Loren makes per hour and how much Julie makes per hour?

f.   Julie works $\frac{1}{12}$ hours/dollar. Write a one or two-sentence explanation of what this rate means. Use this rate to find how long it takes for Julie to earn $228.

4. Your mother takes you to your grandparents' house for dinner. She drives 60 minutes at a constant speed of 40 miles per hour. She reaches the highway and quickly speeds up and drives for another 30 minutes at constant speed of 70 miles per hour.

   a. How far did you and your mother travel altogether?

   b. How long did the trip take?

   c. Your older brother drove to your grandparents' house in a different car, but left from the same location at the same time. If he traveled at a constant speed of 60 miles per hour, explain why he would reach your grandparents house first. Use words, diagrams, or numbers to explain your reasoning.

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, or 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	6.RP.A.3c	Student was unable to depict the problem using a table, diagram, or equation, and the student either answered incorrectly or did not answer the question at all.	Student depicted the problem using a table, diagram, or equation, but had significant errors in their reasoning or calculations, leading to an incorrect answer.	Student was able to answer the question correctly, but was not able to explain their reasoning process with an accurate depiction using a table, diagram, or equation. OR Student gave an accurate depiction of the problem, but made a minor calculation or articulation error in arriving at the answer.	Student gave an accurate depiction of the problem with a table, diagram, or equation and connected that depiction to a correct answer to the question.
2	a 6.RP.A.2 6.RP.A.3d	Student was unable to answer the question. They were not able to accurately represent the rate or unit rate for Brand A. The student showed no evidence of moving beyond that representation.	Student was able to accurately represent the rate for Brand A, but was unable to determine the unit rate. The student is unable to apply the unit rate to further questioning in the problem.	Student correctly provided the unit rate as 12, but the work lacks connection to the original problem of 60 lb. per $5.	Student correctly provided the rate as 12 pounds per dollar and the unit rate is given as 12.

	b **6.RP.A.2** **6.RP.A.3d**	Student was unable to answer the question. They were not able to accurately represent the rate or unit rate for Brand B and showed no evidence of moving beyond that representation.	Student was able to accurately represent the rate for Brand B, but was unable to apply the unit rate in comparison to the unit rate of Brand A.	Student accurately represented the unit rate of Brand B as 12.5 lb. per $1 and compared the unit rate to being more than Brand A. However, the student did not make connections to the problem and did not determine that Brand B was a better deal because it gives more sand than Brand A.	Student accurately represented both unit rates of Brand A and Brand B. The student determined Brand B was a better unit rate and related the unit rates to the problem.
	c **6.RP.A.2** **6.RP.A.3d**	Student did not answer the question correctly. The total number of cubic feet was not found. The rate of 100 lb./1 ft. was not used to determine the total pounds of sand and the unit rate of the cost of either A or B was not used to determine the total cost of the project.	Student determined the total number of cubic feet. The rates to find the total pounds of sand needed were not used or were miscalculated. The unit rate of the cost of A or B was not used to determine the total cost of the project or was miscalculated.	Student accurately determined the number of cubic feet needed for the project. The rate of 100 lb./1 ft. was accurately calculated to determine the total pounds of sand needed; however, the rate of $1/the unit rate of A or B to determine the final cost was miscalculated.	Student accurately determined the total cubic feet needed, the total pounds of sand needed and used the appropriate rate to determine the final cost of the project. The student used labels accurately to support the reasoning of the final answer.
3	**a** **6.RP.A.1** **6.RP.A.2** **6.RP.A.3a** **6.RP.A.3b**	Student was unable to answer the question. The values were not placed in either table or incorrect values were provided.	Student was able to provide two to three correct values to portions of the tables, but did not support the answers mathematically.	Student was able to provide correct values for three to four portions of the tables, but did not support the answers mathematically.	Student was able to provide correct values for all portions of the tables. The student provided reasoning for the answers using additive patterns and unit rate conversion.
	b **6.RP.A.1** **6.RP.A.2** **6.RP.A.3a** **6.RP.A.3b**	Student did not calculate the hourly rate of either Loren or Julie correctly or did not answer the question. The rates to determine a final answer were not compared.	Student did not correctly calculate the hourly rate of either Loren or Julie and was unable to compare the rates and determine which girl made more money per hour.	Student correctly calculated the hourly rate of each girl, but did not compare the rates to determine which made more money per hour.	Student accurately answered the question and justified their reasoning through comparison of the hourly rates.

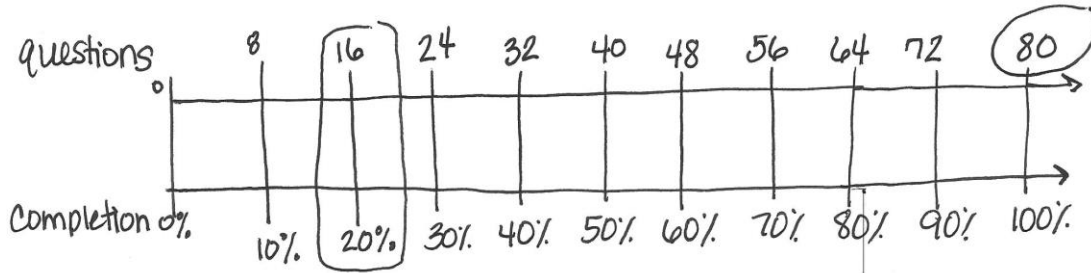|					
	c 6.RP.A.1 6.RP.A.2 6.RP.A.3a 6.RP.A.3b	Student was unable to answer the question. The rate or the unit rate was not accurately determined. The student did not make connections to the values in the table.	Student referenced values from the table. (e.g., $36/3 hrs.), but did not express the values as a rate or a unit rate.	Student correctly determined the rate of Julie's pay as $12 for every hour, but did not determine the unit rate to be 12.	Student accurately answered the question by representing the unit rate as 12 and by referencing the values from the table.
	d 6.RP.A.1 6.RP.A.2 6.RP.A.3a 6.RP.A.3b	Student was unable to answer the question. The correct rate with the amount of hours was not accurately computed. <u>OR</u> Student did not attempt the problem.	Student did not accurately compute the correct rate with the amount of hours, but was proficient in the process to find the correct answer.	Student computed the correct rate with the amount of hours. The student found the total amount of money Julie made in 16 hours. Student work lacked labeling and clear sequence in solving.	Student accurately derived the correct amount of money Julie made in 16 hours. The student used the correct rate and the work was labeled in order to justify the reasoning. The student's work is in logical progression.
	e 6.RP.A.1 6.RP.A.2 6.RP.A.3a 6.RP.A.3b	Student was unable to answer the question. The correct rate of pay for one or both of the girls was not found.	Student was able to compute the accurate rate of pay for the girls, but did not compare to determine which girl made more money per hour.	Student accurately computed the rate of pay for each girl and accurately compared the pay in ratio form. The student did not derive a simplified ratio from the rates of pay.	Student answered the problem accurately, with labels and simplified their final answer.
	f 6.RP.A.1 6.RP.A.2 6.RP.A.3a 6.RP.A.3b	Student explained what the rate meant in the problem, but did not accurately find the answer.	Student explained the meaning of the rate in detail using conversions, but made errors when deriving the plan to solve. *Example: The answer is not indicative of understanding cancellation of units and finds $19 instead of 19 hours.*	Student provided a lucid explanation with conversions and support. The student may have multiplied by minute conversion and found a final answer of 1,140 minutes instead of 19 hours.	Student answered the problem with precision and with coherent explanation of what the rate means. Calculations are accurate and the final answer is supported and justified through appropriate labeling.
4	**a** 6.RP.A.3b	Student was unable to answer the problem accurately. They student was not able to apply the rates to determine the amount of miles.	Student was able to show their intent to multiply the rate by the time to find the miles, but computed incorrectly.	Student multiplied the rates appropriately to the time for each section of the trip. The amount of separate miles was found, but the student did not combine them for a total amount of miles for the trip. <u>OR</u> Student showed	Student completed the entire problem accurately with appropriate labels. The student was able to derive a total distance with no computation errors.

				understanding of the concept, but made computation errors.	
b **6.RP.A.3b**	Student did not complete the problem or answered with an incorrect response.	Student used information from the original problem to determine the addends, but computed the total incorrectly.	Student used information from the original problem to determine addends and computed the sum correctly, but did not report the correct unit.	Student used information from the original problem to determine addends and computed the sum correctly. The student labeled work appropriately and converted the minutes into hours.
c **6.RP.A.3b**	Student did not use a diagram, words, or numbers to support the answer or used the diagram inappropriately. The student did not answer the problem with an accurate response.	Student provided an accurate response, but did not utilize a diagram, words, or numbers to support the answer.	Student provided a correct answer and used only words or numbers to support the answer.	Student used appropriate diagrams, words, and numbers to support the accurate answer.

Name _____   Date _____

1. Jasmine has taken an online boating safety course and is now completing her end of course exam. As she answers each question, the progress bar at the bottom of the screen shows what portion of the test she has finished. She has just completed question 16 and the progress bar shows she is 20% complete. How many total questions are on the test? Use a table, diagram, or equation to justify your answer.

questions
| | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | (80) |

Completion %
10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100%

There are 80 questions on the test!

2. Alisa hopes to play beach volleyball in the Olympics someday. She has convinced her parents to allow her to set up a beach volleyball court in their back yard. A standard beach volleyball court is approximately 26 feet by 52 feet. She figures that she will need the sand to be one foot deep. She goes to the hardware store to shop for sand and sees the following signs on pallets containing bags of sand.

A   SAND   A   SAND   60 lbs $5

B   SAND   B   SAND   150 lbs $12

a. What is the rate that Brand A is selling for? Give the rate and then specify the unit rate.

Brand A → $\dfrac{60 \text{ lbs.}}{\$5}$ ÷5 ÷5 = $\dfrac{12 \text{ lbs.}}{\$1}$ = 12
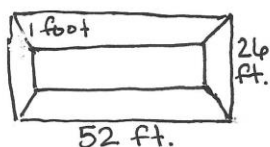
rate   unit rate

b.   Which brand is offering the better value? Explain your answer.

Brand A is selling sand at a rate of 12 lbs per dollar. Brand B is selling at a rate of 12.5 lbs. per dollar. Brand B offers a better value because it gives more sand per dollar.

Brand B ⟶ $\frac{150 \text{ lbs.}}{\$12}$

$\frac{150 \text{ lbs}}{\$12} \begin{array}{c} \div 12 \\ \div 12 \end{array} = \frac{12.5 \text{ lbs}}{\$1}$

c.   Alisa uses her cell phone to search how many pounds of sand is required to fill 1 cubic foot and finds the answer is 100 pounds. Choose one of the brands and compute how much it will cost Alisa to purchase enough sand to fill the court. Identify which brand was chosen as part of your answer.
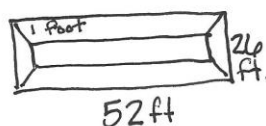
Choose Brand A.

52 ft. × 26 ft. × 1 ft. = 1,352 ft.³

$1,352 \text{ ft}^3 \times \frac{100 \text{ lbs}}{1 \text{ ft}^3} =$ 135,200 lbs.

$135,200 \text{ lbs} \times \frac{\$1}{12 \text{ lbs.}} \approx \$11,266.67$

Alisa will need $11,266.67

Choose Brand B.

52 ft. × 26 ft. × 1 ft. = 1,352 ft.³

$1,352 \text{ ft}^3 \times \frac{100 \text{ lbs.}}{1 \text{ ft}^3} = 135,200 \text{ lbs.}$

$135,200 \text{ lbs.} \times \frac{\$1}{12.5 \text{ lbs}} = \$10,816$

Alisa will need $10,816

3. Loren and Julie have different part time jobs after school. They are both paid at a constant rate of dollars per hour. The tables below show Loren and Julie's total income (amount earned) for working a given amount of time.

Loren

Hours	2	4	6	8	10	12	14	16	18
Dollars	18	36	54	72	90	108	126	144	162

$$\begin{array}{c} 108 \\ +18 \\ \hline 126 \end{array} \qquad \begin{array}{c} 126 \\ +18 \\ \hline 144 \end{array}$$

Julie

Hours	3	6	9	12	15	18	21	24	27
Dollars	36	72	108	144	180	216	252	288	324

a. Find the missing values in the two tables above.

$$\begin{array}{c} 216 \\ +\ 36 \\ \hline 252 \end{array} \qquad \begin{array}{c} 252 \\ +\ 36 \\ \hline 288 \end{array}\checkmark \qquad \begin{array}{c} 36 \\ +\ 36 \\ \hline 72 \end{array}$$

ratio $3:36 = 1:12$
SO, $6:72$

b. Who makes more per hour? Justify your answer.

Loren 2 hrs: $18 → 1 hr.: $9
Julie 3 hrs: $36 → 1 hr.: $12

Loren   Julie
$9 < $12

Julie makes more per hour

c. Write how much Julie makes as a rate. What is the unit rate?

Julie 3:36 → 1:12
$12 per hour
$12/hour
unit rate 12

d.   How much money would Julie earn for working 16 hours?

Julie's rate $\dfrac{\$12}{1\ \text{hour}} \times \dfrac{16\ \text{hours}}{} = \dfrac{\$12 \times 16\ \text{hrs}}{1\ \text{hrs}} =$

$\$12 \times 16 = \$192$

e.   What is the ratio between how much Loren makes per hour and how much Julie makes per hour?

Loren : Julie

$\$9/\text{hr}$: $\$12/\text{hr}$

9 : 12

↓

3 : 4

f.   Julie works $\dfrac{1}{12}$ hours/dollar. Write a one or two-sentence explanation of what this rate means. Use this rate to find how long it takes for Julie to earn $228.

To earn one dollar, Julie has to work $\frac{1}{12}$ of an hour (or 5 minutes).

$\dfrac{\frac{1}{12}\ \text{hrs.}}{\$1} \times \$228 = \dfrac{\frac{1}{12}\ \text{hrs.} \times 228}{\$1} = \frac{1}{12}\ \text{hrs.} \times 228 = 19\ \text{hrs}$

$\begin{array}{r} 19 \\ 12\overline{)228} \\ -12 \\ \hline 108 \\ -108 \\ \hline 0 \end{array}$

4. Your mother takes you to your grandparents' house for dinner. She drives 60 minutes at a constant speed of 40 miles per hour. She reaches the highway and quickly speeds up and drives for another 30 minutes at constant speed of 70 miles per hour.

    a. How far did you and your mother travel altogether?

    $1 \text{hr} \times \frac{40 \text{mi}}{\text{hr}} = 40 \text{miles}$
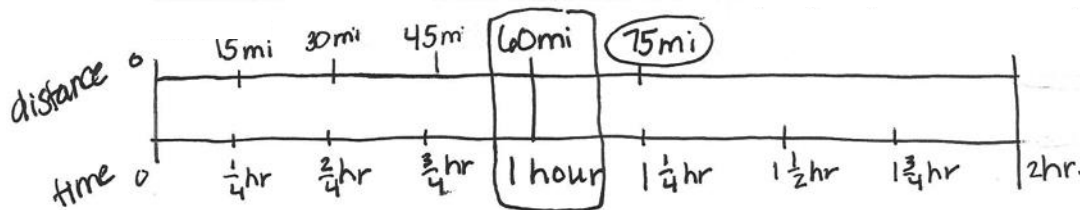
    $0.5 \text{hr} \times \frac{70 \text{mi}}{\text{hr}} = 35 \text{miles}$

    40 miles + 35 miles = 75 miles

    b. How long did the trip take?

    60 minutes + 30 minutes = 90 minutes or $1\frac{1}{2}$ hours.

    c. Your older brother drove to your grandparents' house in a different car, but left from the same location at the same time. If he traveled at a constant speed of 60 miles per hour, explain why he would reach your grandparents house first. Use words, diagrams, or numbers to explain your reasoning.

    The trip is 75 miles long. If he travels 60 miles in 1 hour, it will take him $1\frac{1}{4}$ or 1.25 hours to get there.