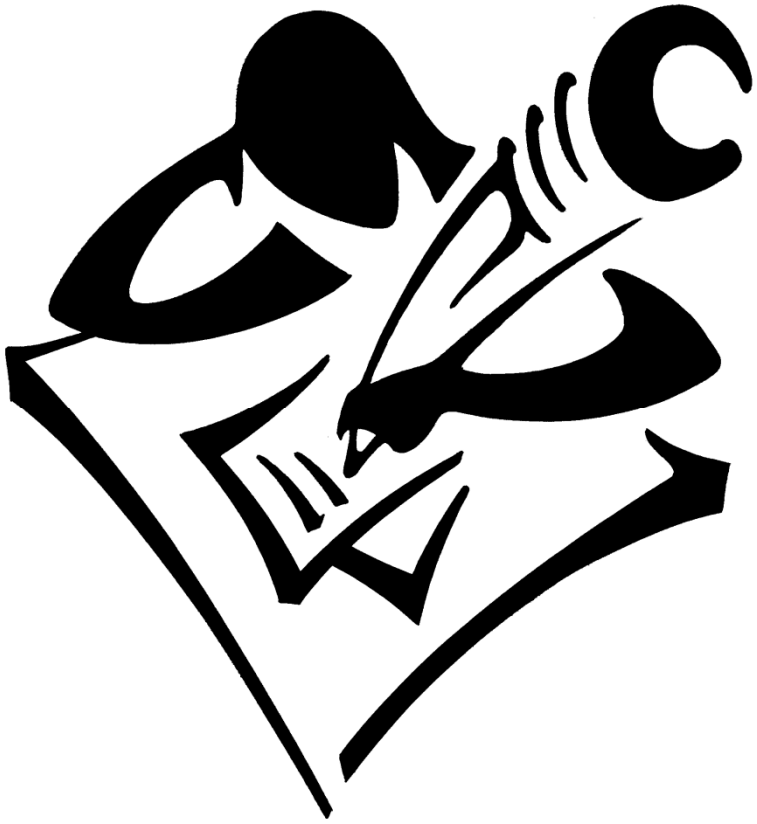
Tennessee Comprehensive Assessment Program

TCAP/CRA 2013



7

Anchor Set

Grade 7 – Rainfall Task

SECURE MATERIAL - Reader Name: _____

Tennessee Comprehensive Assessment Program

Copyright © 2013 by the University of Pittsburgh and published under contract with Tennessee State Department of Education by Measurement Incorporated, 423 Morris Street, Durham, North Carolina, 27701. Testing items licensed to the Tennessee State Department of Education. All rights reserved. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of Tennessee Department of Education and the University of Pittsburgh.

Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

CC BY ND

GO ON TO THE NEXT PAGE

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.

c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.

CC BY ND

The CCSS for Mathematical Content Addressed In This Task

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
7.EE.B.4b	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.

The CCSS for Mathematical Practice*

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

* Gray type indicates Mathematical Practices not addressed in this assessment.

Scoring Guide

The CCSS for Mathematical Content (2 points)

7.NS.A.3 Determines the amount of rain that will be in the rain gauge after 15 hours. The student may do this in a way such as the following: _____

- Extending the table using the rate of change provided;
- Multiplying 0.25 by 5 hours and adding 7.3 or multiplying 0.25 by 15 and adding 4.8;
- Setting up and evaluating an algebraic expression **(1 Point)**

7.EE.B.4b Determines whether or not the output value is greater than 10.5 cm when the input value is 24 hours. The student may do this in a way such as the following: _____

- Setting up and solving the inequality $0.25h + 4.8 > 10.5$, or an equivalent inequality algebraically;
- Extending the data table until it reaches 24 hours;
- Graphing the points shown in the data table and then extending the graph to the point where the x-coordinate is 24. **(1 Point)**

The CCSS for Mathematical Practice (3 points)

MP1 Completes all parts of the problem, making sense of 0 as representing 7:00 am and recognizing that rain fell prior to time equals 0. _____
(1 Point)
(MP1: Make sense of problems and persevere in solving them.)

MP3 Indicates that Alexis' reasoning does not provide sufficient evidence of proportionality because a constant rate of change is not enough to indicate proportionality. Student may do this by: _____

- Checking to see if the point (0,0) is represented in the data table;
- Graphing the data points to see whether the relationship is linear and passes through the origin;
- Using multiplication or division to look for a constant of proportionality in the table (e.g., does $\frac{6}{4} = \frac{6.3}{5.8}$?). **(1 Point)**

(MP3: Construct viable arguments and critique the reasoning of others.)

MP6 Performs all mathematical calculations accurately, uses correct mathematical language and notation, and correctly labels quantities. **(1 Point)** _____
(MP6: Attend to precision.)

TOTAL POINTS: 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

Alexis is wrong. The rainfall increases by the same amount each hour, but there was 4.8 cm at 0 hours, not 0 cm.

So the ratios $\frac{5.8}{4}$, $\frac{6.3}{6}$, $\frac{7.3}{10}$ are not equal.

A-1b

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.

7.3 cm at 10 hours

10 + 5 = 15 hours

7.3 cm + 5(.25) cm = rain at 15 hrs

7.3 cm + 1.25 cm = rain at 15 hrs

8.55 cm = rain at 15 hrs

c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.

They will cancel the trip.

7:00 AM Friday → 7:00 AM Saturday is 24 hours

cm	4.8	5.8	6.3	7.3	8.55	10.8
hours	0	1	6	10	15	24

2.25 × 9 = 2.25

8.55 + 2.25 = 10.80

2.25 cm in 9 hours

more than 10.5 centimeters fall before 7 Saturday.

Litho#: 00127200012

Anchor 1 Litho 00127200012

Total Content Points: 2 (7.NS.A.3, 7.EE.B.4b)

Total Practice Points: 3 (MP1, MP3, MP6)

The student correctly uses multiplication and addition to find the amount of rain in the gauge after 15 hours (7.NS.A.3). In Part C, the student completes the table using multiplication to find the amount of rain added to the gauge in the nine hours between hour 15 and hour 24, and recognizes that the amount is large enough that Alexis and Benji will cancel their trip (7.EE.B.4b). The student completes all parts of the problem, and indicates that there was already rain in the gauge at hour 0 ("there was 4.8 cm at 0 hours, not 0 cm") (MP1). The student correctly disagrees with Alexis in Part A, and explains the disagreement by pointing out that the amount of rain in the gauge at hour 0 is not 0, and that the ratios for each time period for $\frac{\text{the amount of rain}}{\text{hours passed}}$ are not equal (MP3). All of the calculations shown are accurate, notation is sufficiently precise, and labels are used (MP6).

Total Awarded Points: 5 out of 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

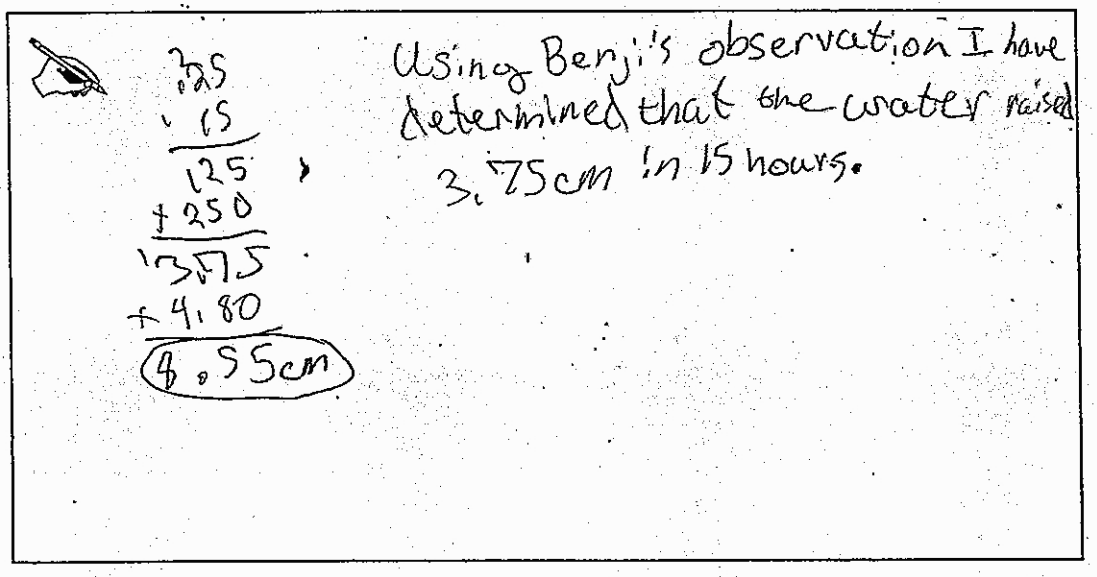
They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

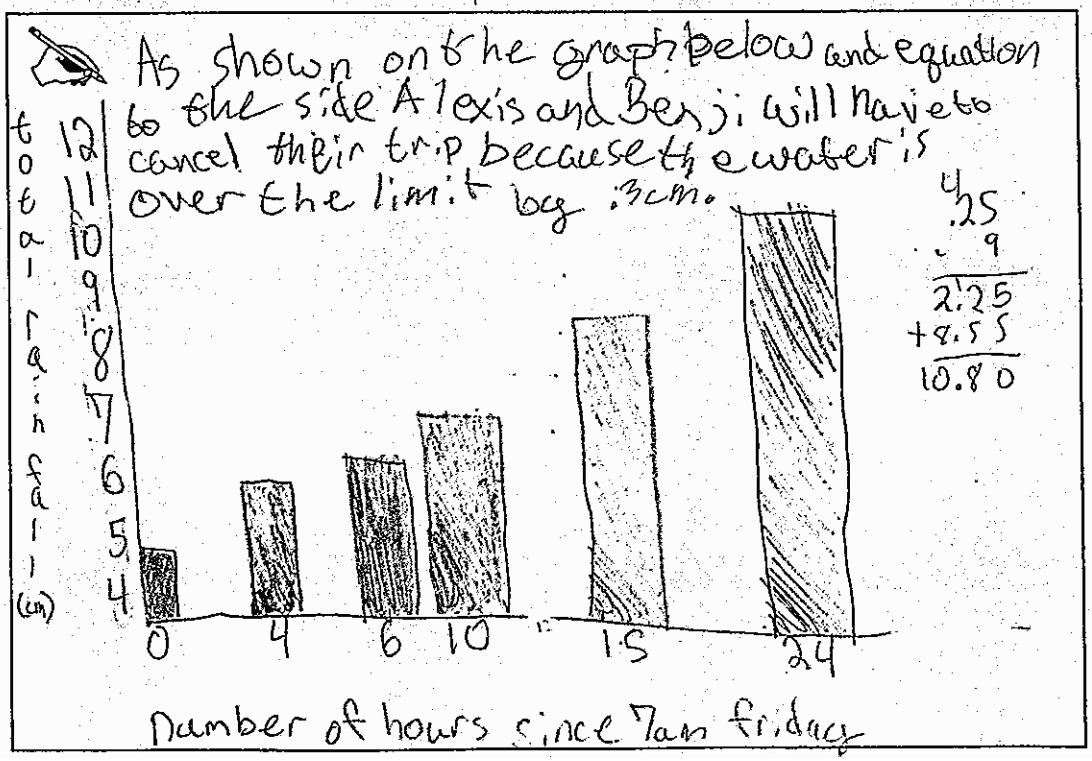
a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

I do agree with alexis. From 7am to 11am (4hours ahead) the water level raised 1cm. from 11pm (6.4hours ahead) to 5pm (10hours ahead) it raised 1 cm. However from 11am to 1pm it only raised .5cm, but the time was also cut in half.

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.



c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.



Anchor 2 Litho 00497200012

Total Content Points: 2 (7.NS.A.3, 7.EE.B.4b)

Total Practice Points: 2 (MP1, MP6)

The student uses multiplication and addition to correctly determine the amount of rain in the gauge after 15 hours (7.NS.A.3). The student calculates the total amount of rainfall after 24 hours and correctly concludes that Alexis and Benji will cancel their trip (7.EE.B.4b). The student completes all parts of the problem and recognizes that 0 represents 7:00 a.m. Friday and that rain had already fallen prior to that time (MP1). The student incorrectly agrees with Alexis in Part A and provides an explanation that does not demonstrate understanding of proportionality (no credit for MP3). All calculations are correct, mathematical language and notation is precise, and labels are used (MP6).

Total Awarded Points: 4 out of 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

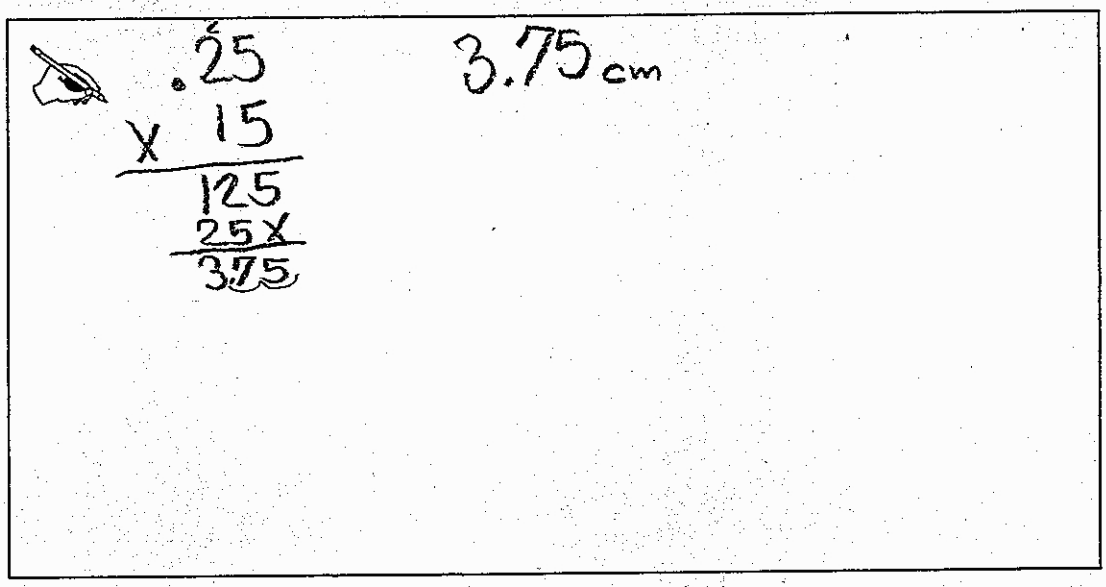
Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

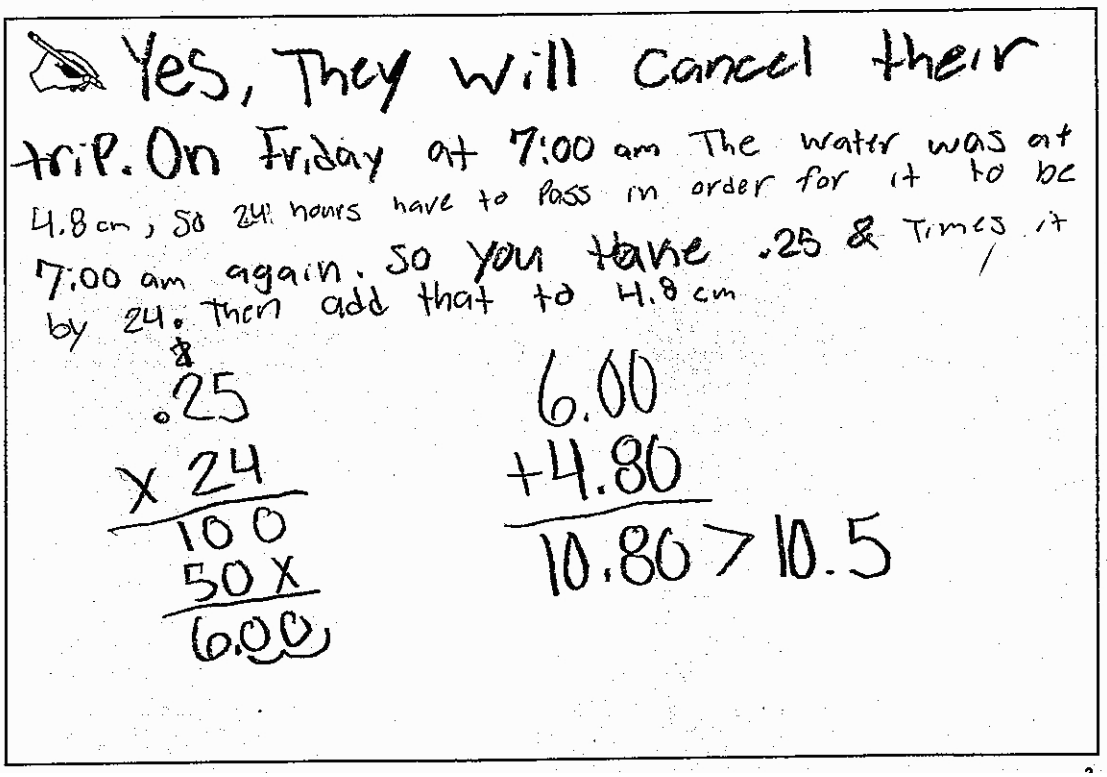
Yes, because every 2 hours it rains .5 cent.meters. So for 4 hours it filled UP 1 centimeters.

Litho#: 0008

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.



c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.



Anchor 3 Litho 0008

Total Content Points: 1 (7.EE.B.4b)

Total Practice Points: 2 (MP1, MP6)

The student calculates the amount of rain that will fall in 15 hours in Part B, but does not add that to the rainfall already in the gauge (no credit for 7.NS.A.3). The student calculates the total amount of rainfall after 24 hours and correctly concludes that Alexis and Benji will cancel their trip (7.EE.B.4b). The student completes all parts of the problem, and the explanation in Part C demonstrates understanding that 0 represents 7:00 a.m. Friday and that rain had already fallen prior to that time (MP1). The student incorrectly agrees with Alexis in Part A and provides an explanation that does not demonstrate understanding of proportionality (no credit for MP3). All calculations are correct, mathematical language and notation is precise, and labels are used (MP6).

Total Awarded Points: 3 out of 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

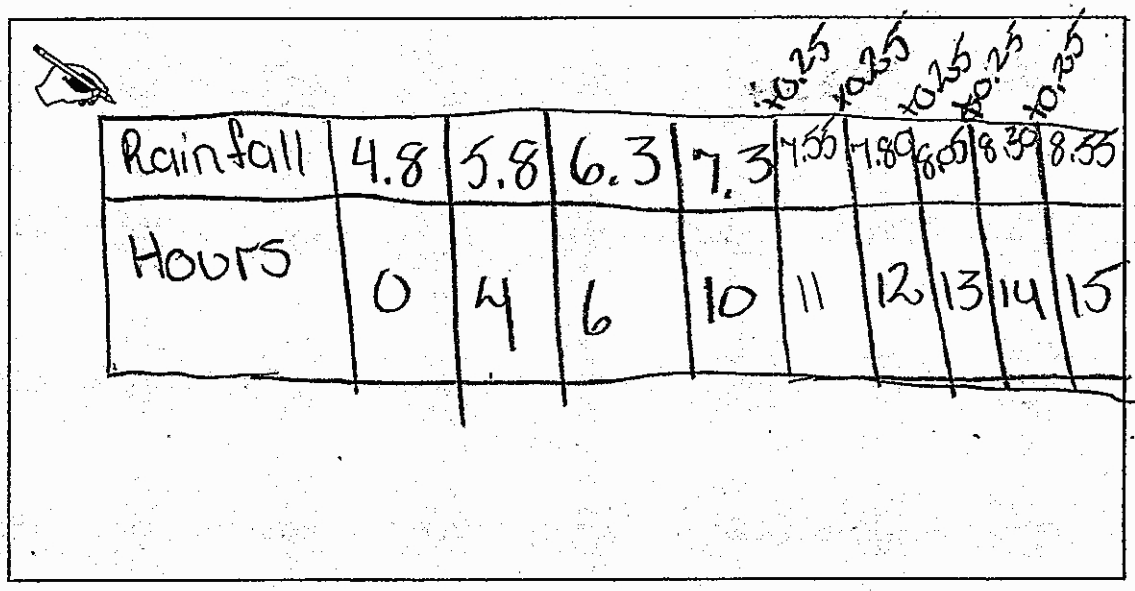
Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

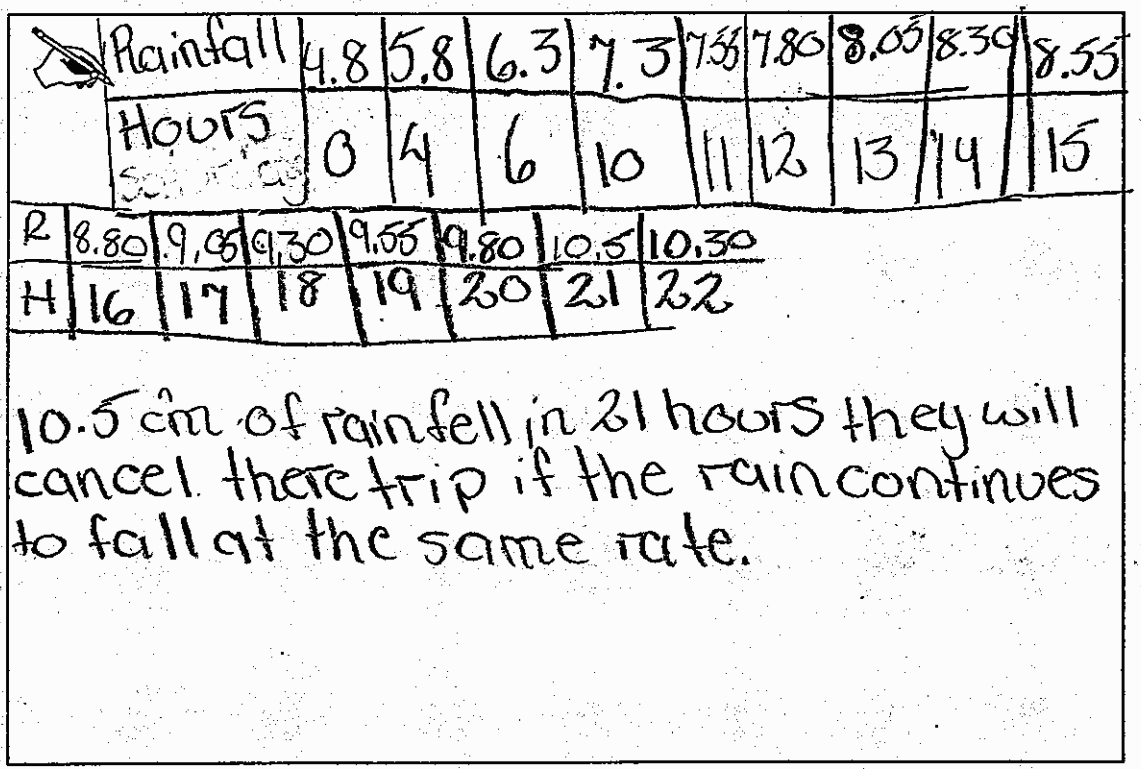
Yes, I agree because and extra centimeter was added to every rainfall.

		+1.0		+1.0
total Rainfall	4.8	5.8	6.3	7.3
#Number of Hours since 7:00 a.m. Friday	0	4	6	10

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.



c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.



Anchor 4 Litho 00297200016

Total Content Points: 2 (7.NS.A.3, 7.EE.B.4b)

Total Practice Points: 1 (MP1)

The student extends the data table to determine the amount of rain in the gauge after 15 hours (7.NS.A.3). While the student extends the data table to determine whether or not the trip will be cancelled, a minor transcription error is made when filling in the 21st hour (10.5 for 10.05). The student then makes the logical conclusion consistent with the error that the trip will be cancelled, because the total amount of rainfall will be more than 10.5 by the 21st hour, which comes before 7:00 a.m. (7.EE.B.4b). The student completes all parts of the problem and recognizes that 0 represents 7:00 a.m. Friday and that rain had already fallen prior to that time (MP1). The student incorrectly agrees with Alexis in Part A and provides an explanation that does not demonstrate understanding of proportionality (no credit for MP3). The student writes the incorrect amount of rainfall for 21 hours, demonstrating a lack of precision (no credit for MP6).

Total Awarded Points: 3 out of 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

Yes I agree with Alexis because on 0hours it was 4.8 and on 4hours it is 5.8 and on 6hours it 6.3 and on 10hours it 7.3 so the add 1more on 4hours than 0 hours and the add 1 more on 10 hours than 6 hours So yes it is a preportinal relation ship.

0hours 4hours 6hours 10hours

4.8+1=5.8 6.3+1=7.3

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.

0.25 centimeters per hour
x 15 hours
3.75 centimeters after 15 hours

c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.

Rain	4.8	5.8	6.3	7.3	7.8	8.8	9.3	9.3	10.8
hr	0	4	6	10	12	16	18	22	24

Yes because it's been 24 hours and the total amount of rain fall is 10.8 and they said the would cancel the trip a 10.5 rainfall and it's past that amount.

Anchor 5 Litho 00737200016

Total Content Points: 1 (7.EE.B.4b)

Total Practice Points: 1 (MP1)

The student calculates the amount of rain that falls in 15 hours, but does not add that to the rain already in the gauge (no credit for 7.NS.A.3). The student extends the data table to determine the total amount of rain in the gauge after 24 hours, and then correctly concludes that Alexis and Benji will cancel their trip (7.EE.B.4b). The student completes all parts of the problem, and the work in Part C shows recognition that 0 represents 7:00 a.m. Friday and that rain had already fallen prior to that time (MP1). The student incorrectly agrees with Alexis in Part A and provides an explanation that does not demonstrate understanding of proportionality (no credit for MP3). The student uses imprecise mathematical language in Part A, making the response unclear (no credit for MP6).

Total Awarded Points: 2 out of 5

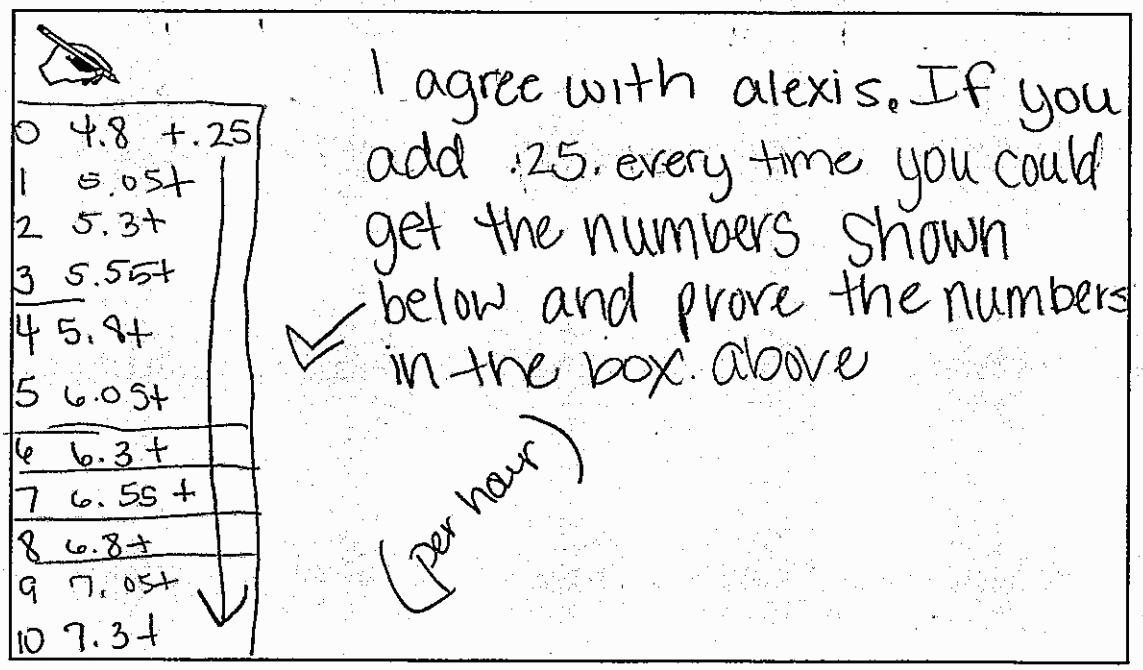
1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

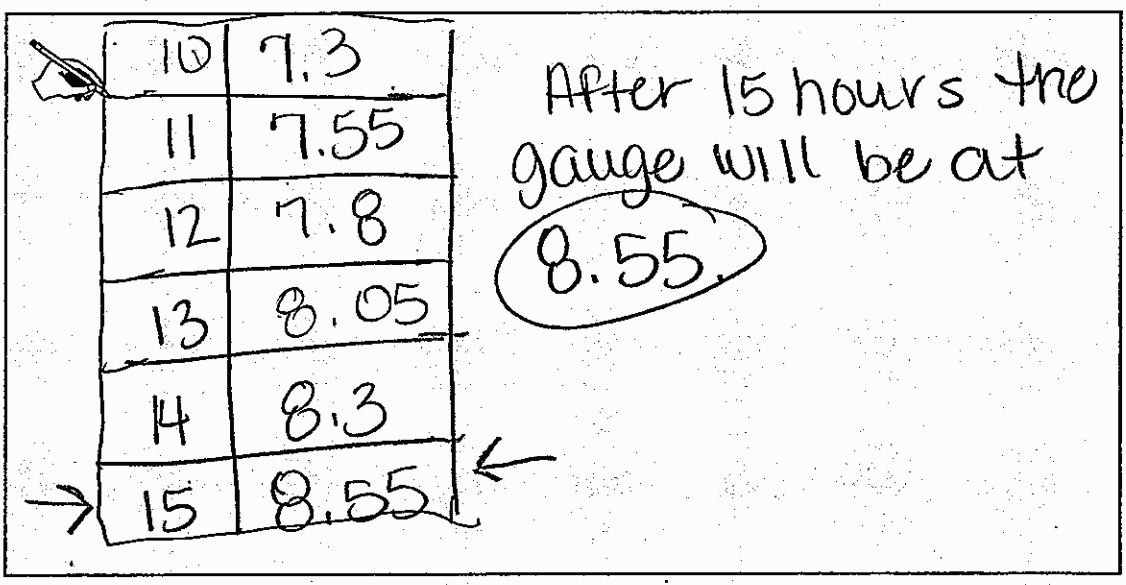
Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

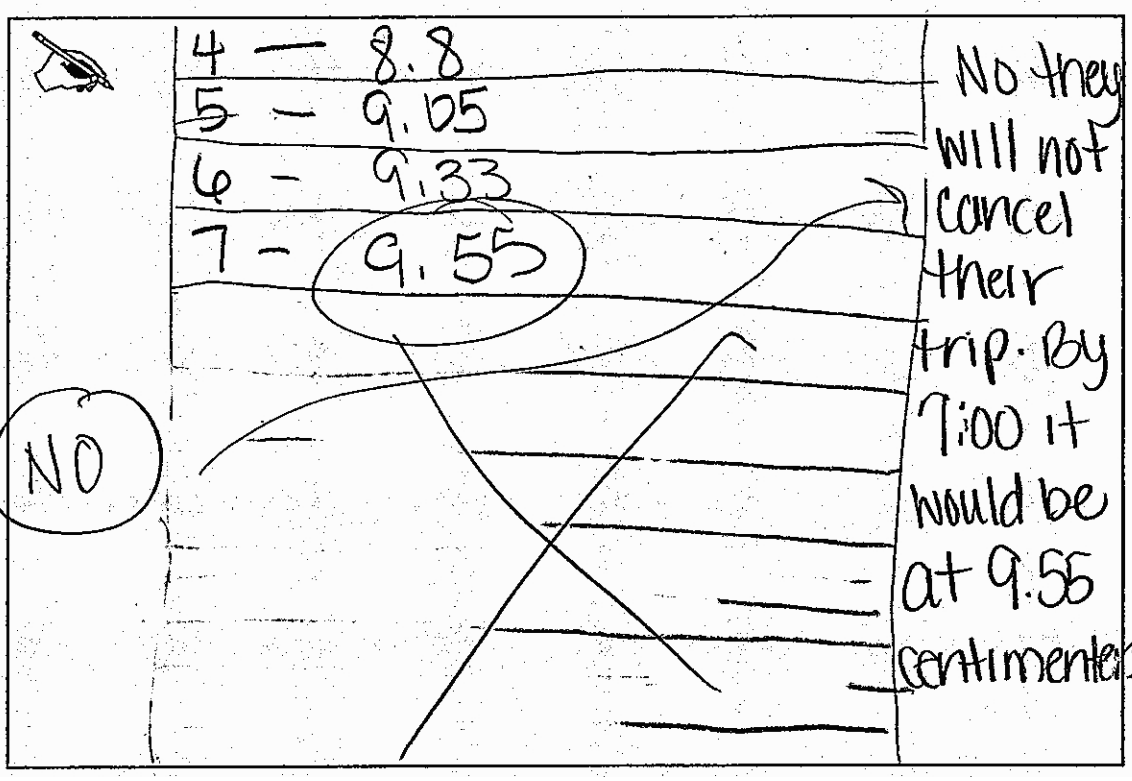


Grade 7 — 2013–14, Phase 1, Stage 2 Pilot
Constructed Response Assessment

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.



c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.



Litho#: 00107200016

Anchor 6 Litho 00107200016

Total Content Points: 1 (7.NS.A.3)

Total Practice Points: 1 (MP1)

The student extends the data table to determine how much rain will be in the gauge after 15 hours (7.NS.A.3). The student extends the data table incorrectly in Part C due to a fundamental error in applying the rate of change, rather than a simple error in transcription, and, due to the incorrect table, correctly draws the inaccurate conclusion that Alexis and Benji will not cancel their trip. Although the conclusion drawn is correct based on the incorrect table, the error in completing the table is significant enough to indicate a misunderstanding of the word problem (no credit for 7.EE.B.4b). The student completes all parts of the problem, and the work shown in Part A and Part B clearly shows that the student understands there was rain in the gauge prior to hour 0 (MP1). The student incorrectly agrees with Alexis in Part A and provides an explanation that does not demonstrate understanding of proportionality (no credit for MP3). The response is insufficiently labeled; for instance, it is unclear what the hours 4–7 denote in Part C (no credit for MP6).

Total Awarded Points: 2 out of 5

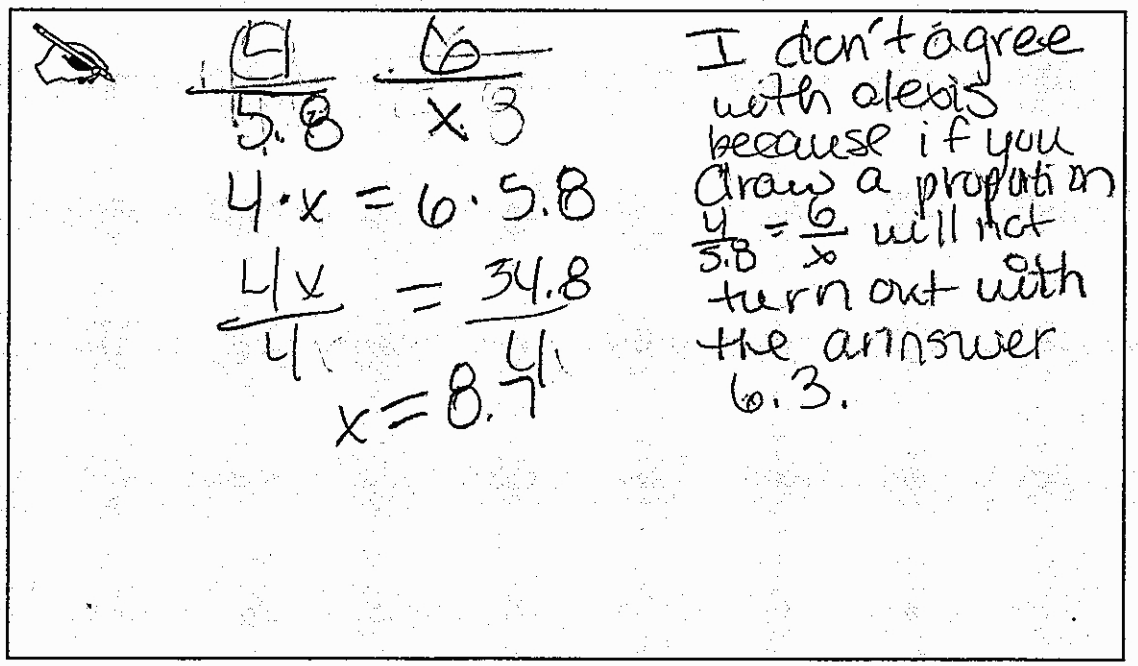
1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.



b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.

$$\frac{0.25}{1} = \frac{15}{x}$$

$$0.25 \cdot x = 15 \cdot 1$$

$$\frac{0.25x}{0.25} = \frac{15}{0.25}$$

$$x = 60$$

c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.

Total Rainfall	4.8	5.8	6.3	7.3	8.8	9.8	10.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10	16	20	30

5.8 − 4.8 = 1.0

7.3 − 6.3 = 1.0

Anchor 7 Litho 00177200016

Total Content Points: 0

Total Practice Points: 1 (MP3)

The student does not correctly determine the amount of rain in the gauge after 15 hours (no credit for 7.NS.A.3). The student extends the data table incorrectly in Part C and draws no conclusion (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but shows no understanding that 0 represents 7:00 a.m. Friday or that rain had already fallen prior to that point (no credit for MP1). The student disagrees with Alexis in Part A and provides a correct explanation ("if you draw a proportion $\frac{4}{5.8} = \frac{6}{x}$ will not turn out with the answer 6.3") (MP3). The incorrectly completed table in Part C demonstrates a lack of precision (no credit for MP6).

Total Awarded Points: 1 out of 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

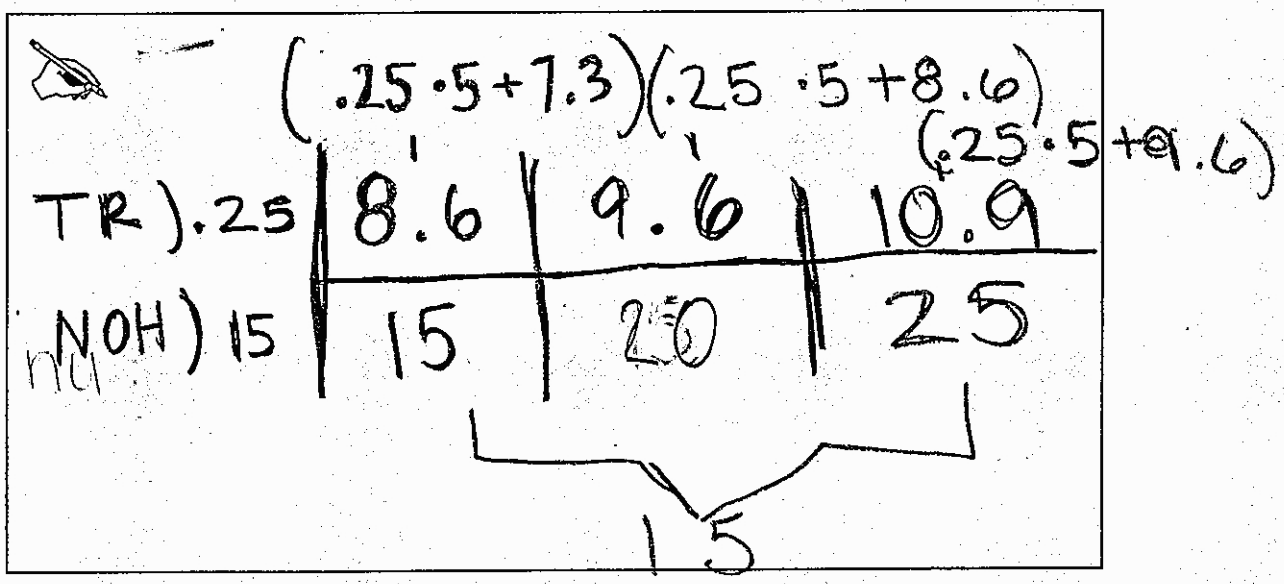
The numbers are not Proportional relationship

4.8 = 48% / 0 7.3 =

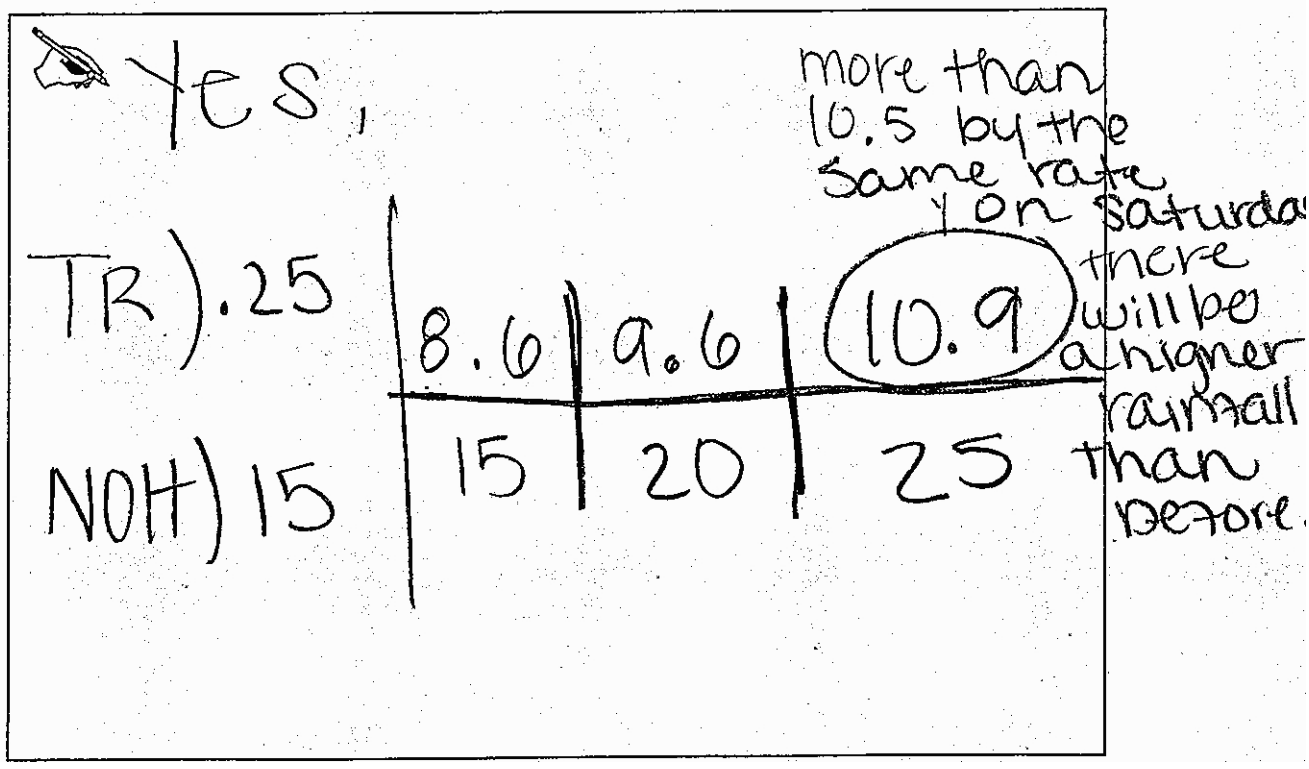
5.8 = 58% / 4 73% /

6.3 = 63% / 6 10

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.



c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.



Anchor 8 Litho 0053

Total Content Points: 1 (7.NS.A.3)

Total Practice Points: 0

The student correctly calculates the amount of rain in the gauge after 15 hours in Part B, and then rounds to the nearest tenth to get 8.6 (7.NS.A.3). The student attempts to extend the table in Part C, but makes a calculation error at 20 hours and extends the table to 25 hours instead of 24, providing no evidence that the rain will exceed 10.5 cm at 24 hours (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but the use of 25 in Part C makes it unclear if the student understands that 0 represents 7:00 a.m. Friday (no credit for MP1). The student correctly disagrees with Alexis in Part A, but the explanation uses invalid mathematical reasoning $\left(4.8 = \frac{48\%}{0}, 5.8 = \frac{58\%}{4}\right)$ (no credit for MP3). The student makes a calculation error when determining the rainfall at 20 hours (no credit for MP6).

Total Awarded Points: 1 out of 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

NO, because they don't all equal the same number when you divide both numbers.

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.

15 ÷ 0.25 = 60

The answer is going to be 60.

c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.

NO, because the amount of rain will be going down.

Anchor 9 Litho 0020

Total Content Points: 0

Total Practice Points: 0

In Part B, the student does not correctly calculate the amount of rain in the gauge after 15 hours (no credit for 7.NS.A.3). The student incorrectly states that Alexis and Benji will not cancel their trip, and provides no mathematical or graphical reasoning for this conclusion (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but demonstrates no understanding that 0 represents 7:00 a.m. Friday or that rain fell prior to that time (no credit for MP1). The student correctly disagrees with Alexis in Part A, and the explanation ("they don't all equal the same number when you divide both numbers") is potentially true depending on what the student means by "divide both numbers." More specific language or some appropriate calculations would be needed to make the point clear (no credit for MP3). The student does not show enough work to demonstrate correct mathematical language and notation, and no quantities are labeled (no credit for MP6).

Total Awarded Points: 0 out of 5

1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.

Yes because it is .8 on the first two.

A-10b

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.

it will be 8.55 cm of rain in the guage at 15 hours

c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.

No they will not cancel their trip because the water will not get that high.

Anchor 10 Litho 0060

Total Content Points: 0

Total Practice Points: 0

The student correctly determines the amount of rain in the gauge after 15 hours, but no work is shown (no credit for 7.NS.A.3). The student incorrectly states that Alexis and Benji will not cancel their trip, and provides no mathematical or graphical reasoning for this conclusion (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but demonstrates no understanding that 0 represents 7:00 a.m. Friday or that rain fell prior to that time (no credit for MP1). The student incorrectly agrees with Alexis in Part A, and the explanation is unclear and insufficient (no credit for MP3). The student does not show enough work to demonstrate correct mathematical language and notation (no credit for MP6).

Total Awarded Points: 0 out of 5

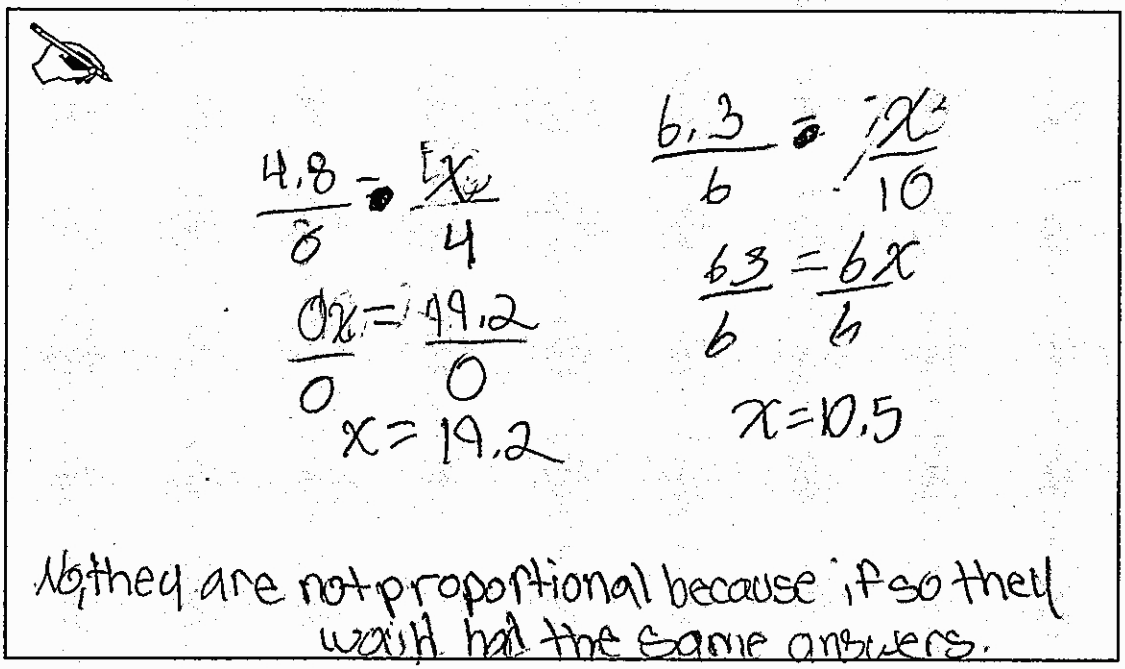
1. Rainfall Task

Alexis and her brother Benji want to go on a boating trip this weekend, but if the water in the river rises too much they will cancel the trip.

They checked their rain gauge Thursday night before it started raining and saw that it was empty. When Benji woke up at 7:00 a.m. Friday morning, he saw that there were 4.8 centimeters of rainwater in the gauge. Alexis and Benji continued to record the amount of rainfall in the table below.

Total Rainfall (cm)	4.8	5.8	6.3	7.3
Number of Hours since 7:00 a.m. Friday	0	4	6	10

a. Alexis claims that the relationship between the amount of rain in the gauge and the number of hours displayed in the table is a proportional relationship because the amount of rainfall between 0 and 4 hours is the same as the amount of rainfall between 6 and 10 hours. Do you agree with Alexis that the relationship is proportional? Use mathematical reasoning to explain why you agree or disagree with Alexis.



$\frac{4.8}{0} = \frac{4x}{4}$

$\frac{0x}{0} = \frac{19.2}{0}$

$x = 19.2$

$\frac{6.3}{6} = \frac{10x}{10}$

$\frac{63}{6} = \frac{6x}{6}$

$x = 10.5$

No, they are not proportional because if so they would have the same answers.

b. Benji observes that the amount of rain in the gauge is increasing at a constant rate of 0.25 centimeters per hour. Use Benji's observation to determine how much rain will be in the gauge after 15 hours. Show your work.

$\frac{5.8}{4} = \frac{x}{15}$

$\frac{4x}{4} = \frac{87}{4}$

$x = 21.75$

There would be 21.75cm of rain in the gauge after 15 hours.

c. If the total amount of rainfall is more than 10.5 centimeters by 7:00 a.m. Saturday, Alexis and Benji will cancel their trip. Assuming the rain continues to fall at the same rate, will they cancel their trip? Use words and a table, graph, or equation to justify your decision.

Yes, they will cancel their trip.

cm	4.8	5.8	6.3	7.3	7.8	8.8	9.3
Hr	10	14	16	20	22	26	28

Anchor 11 Litho 00057200016

Total Content Points: 0

Total Practice Points: 0

In Part B, the student does not correctly calculate the amount of rain in the gauge after 15 hours (no credit for 7.NS.A.3). The student extends the data table in Part C, but stops at 18 hours and 9.3 cm, which is insufficient to determine whether the trip would be cancelled (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but because the data table is incomplete, it fails to clearly demonstrate that the student understands that 0 represents 7:00 a.m. Friday (no credit for MP1). The student correctly disagrees with Alexis in Part A. However, it is unclear whether the explanation ("if so they would had the same answers") means 19.2 and 10.5 would have been the same as each other or as the numbers in the data table (no credit for MP3). This explanation also lacks precision of mathematical language. In addition, the student divides by 0 in Part A and gets a numerical answer, demonstrating a further lack of precision (no credit for MP6).

Total Awarded Points: 0 out of 5