

SECURE MATERIAL - Reader Name: _____
Tennessee Comprehensive Assessment Program

TCAP/CRA

2014



7

Phase III

Winter in Denmark Task

Anchor Set

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**Grade 7 — 2013–14, Phase III
Constructed Response Assessment**

Winter in Denmark Task


In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.



- b. What is the mean temperature for the days shown in the chart? Show your work.





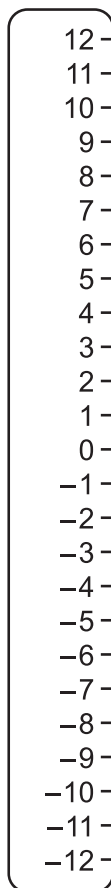
Grade 7 — 2013–14, Phase III
Constructed Response Assessment

Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.



- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



Scoring Guide

The CCSS for Mathematical Content (4 points)

- 7.NS.A.1c Writes two equivalent expressions that can be used to find the difference between the highest and lowest temperatures. The following are correct expressions; students may meet the content standard even if the least and greatest values are incorrectly identified. _____
- $7 - (-10)$
 - $7 + 10$
 - $7 + |-10|$
 - $|7 - (-10)|$
 - $|(-10) - 7|$
- (1 Point)**
- 7.NS.A.3 Uses addition and division to correctly find the mean for the temperatures shown in the chart. _____
- (1 Point)**
- 7.NS.A1a Determines a temperature for the 10th day that will result in an overall sum of 0. _____
- (1 Point)**
- 7.NS.A.1 Uses the number line to find the temperature at midnight. _____
- (1 Point)**

The CCSS for Mathematical Practice (3 points)

- MP1 Completes all parts of the problem by applying mathematical reasoning. Correctly identifies the high and low temperatures in part a, and shows work in part b. _____
(1 Point)
(MP1: Make sense of problems and persevere in solving them.)
- MP3 Explains in part c that in order for the mean to equal zero, the sum of the temperatures must equal zero. _____
(1 Point)
(MP3: Construct viable arguments and critique the reasoning of others.)
- MP6 Algebraic expressions and all calculations are correct; mathematical language and notation is precise. _____
(1 Point)
(MP6: Attend to precision.)

TOTAL POINTS 7

The CCSS for Mathematical Content Addressed In This Task

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	
7.NS.A.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
7.NS.A.1a	Describe situations in which opposite quantities combine to make 0. <i>For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</i>
7.NS.A.1c	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
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.


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Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°


- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.



$$7 - (-10) = 17^{\circ}$$

$$|7| + |-10| = 17^{\circ}$$

- b. What is the mean temperature for the days shown in the chart? Show your work.



$$2 - 8 + 3 + 7 - 10 - 6 + 2 + 7 - 3 = -6$$


$$-\frac{6}{9} = -\frac{2}{3}$$

$$-0.7^{\circ}$$

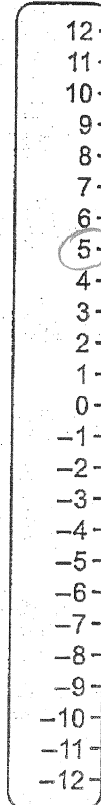
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Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.

 It should be 6° b/c $-6 + 6 = 0$
and $9 \overline{)0}$ is 0.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



Anchor 1 Litho 00437200163

Total Content Points: 4 (7.NS.A.1c, 7.NS.A.3, 7.NS.A.1a, 7.NS.A.1)

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

In Part A, the student writes two equivalent expressions that can be used to determine the difference between 7 and -10 (7.NS.A.1c). In Part B, the student correctly finds the mean (-0.7°) for the temperatures shown in the chart (7.NS.A.3). In Part C, the student determines a temperature for the 10th day (6°) that will result in an overall sum of 0 (7.NS.A.1a). In Part D, the student uses the number line (by counting down from 5) to find the temperature (-2°) at midnight (7.NS.A.1). The student completes all parts of the problem and shows sufficient work in Part B, and the equations shown in Part A indicate the high and low temperatures (MP1). The student explains in Part C why the sum of the temperatures must equal zero if the mean is to equal zero (MP3). Algebraic expressions and all calculations are correct; mathematical language and notation are precise (MP6).

Total Awarded Points: 7 out of 7

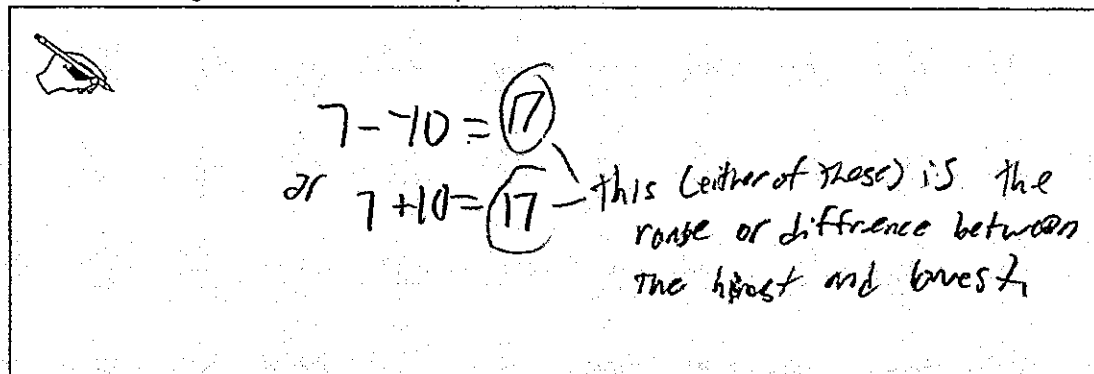
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Winter in Denmark Task

In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.



Handwritten student work for part a:

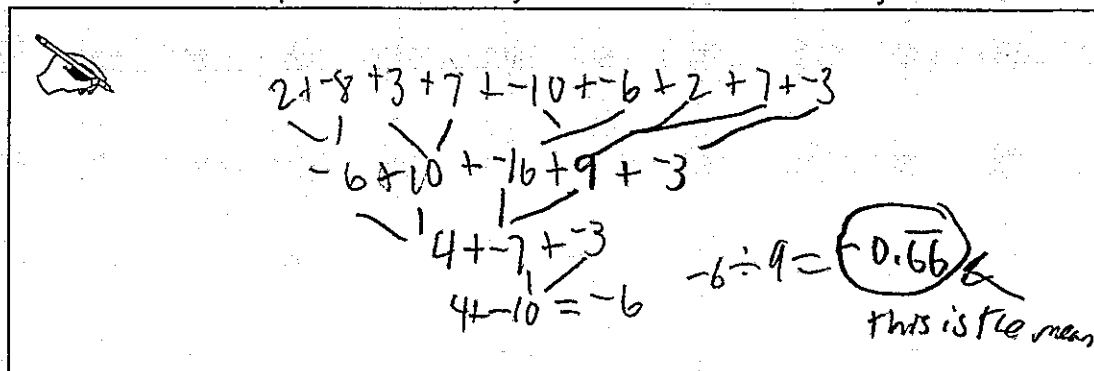
$$7 - (-10) = 17$$

or

$$7 + 10 = 17$$

this (either of these) is the range or difference between the highest and lowest

- b. What is the mean temperature for the days shown in the chart? Show your work.



Handwritten student work for part b:

$$2 + (-8) + 3 + 7 + (-10) + (-6) + 2 + 7 + (-3)$$

$$= -6 + 10 + (-6) + 9 + (-3)$$

$$= 4 + (-7) + (-3)$$

$$= 4 - 10 = -6$$

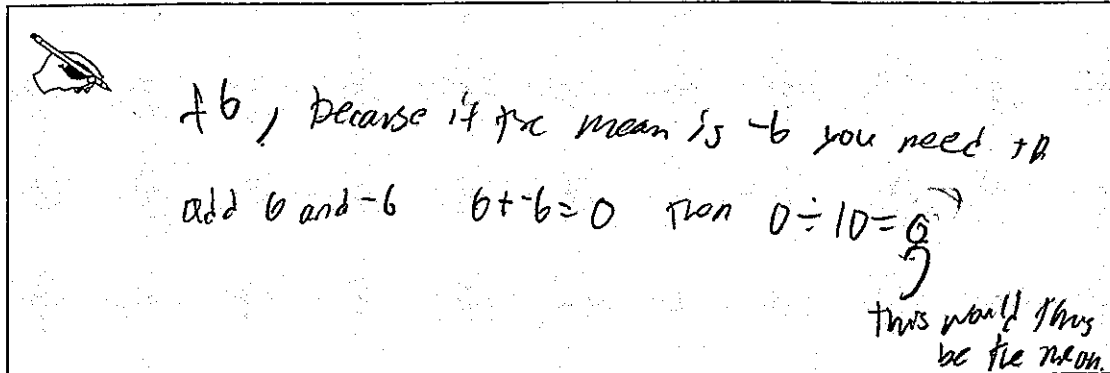
$$-6 \div 9 = -0.\overline{666}$$


this is the mean

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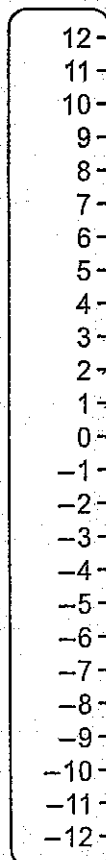
Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.




 +6, because if the mean is 0 you need to
 add 6 and -6 $6 + -6 = 0$ then $0 \div 10 = 0$
 this would thus be the mean.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



original

the temp at mid night

Anchor 2

Litho 00597200163

Total Content Points: 4 (7.NS.A.1c, 7.NS.A.3, 7.NS.A.1a, 7.NS.A.1)

Total Practice Points: 2 (MP1, MP3)

In Part A, the student writes two equivalent expressions that can be used to determine the difference between 7 and -10 (7.NS.A.1c). In Part B, the student correctly finds the mean ($-0.\overline{66}$) for the temperatures shown in the chart (7.NS.A.3). In Part C, the student determines a temperature for the 10th day (+6) that will result in an overall sum of 0 (7.NS.A.1a). In Part D, the student uses the number line (by marking both of the relevant temperatures) to find the temperature (-2) at midnight (7.NS.A.1). The student completes all parts of the problem, shows acceptable work in Part B, and the equations shown in Part A indicate the high and low temperatures (MP1). The student explains in Part C why the sum of the temperatures must equal zero if the mean is to equal zero (MP3). The student does not use precise mathematical notation in Parts B, C, and D by not expressing temperatures in terms of degrees (no credit for MP6).

Total Awarded Points: 6 out of 7

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Winter in Denmark Task

In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.


Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

7 is highest
-10 is lowest

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 $7 - (-10) = X$ $X - (-10) = 7$
 $X = 17$


- b. What is the mean temperature for the days shown in the chart? Show your work.

 $2 + (-8) + 3 + 7 + (-10) + (-6) + 2 + 7 + (-3) = 6 \div 9 = -0.\bar{6}$
 $-0.\bar{6}$ is the mean because you have to add them up + then divide by the # of them (9).

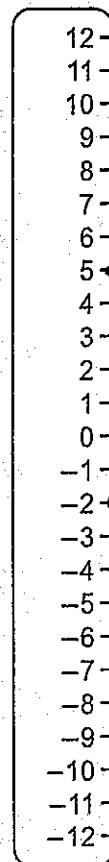
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- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.

 +6 because if you add them all up it equals -6, and to get that to 0 you would add 6.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



The temperature would be -2°

Anchor 3

Litho 00577200163

Total Content Points: 4 (7.NS.A.1c, 7.NS.A.3, 7.NS.A.1a, 7.NS.A.1)

Total Practice Points: 1 (MP1)

In Part A, the student writes two equivalent equations that can be used to determine the difference between 7 and -10 (7.NS.A.1c). In Part B, the student correctly finds the mean ($-0.\bar{6}$) for the temperatures shown in the chart (7.NS.A.3). In Part C, the student determines a temperature for the 10th day (+6) that will result in an overall sum of 0 (7.NS.A.1a). In Part D, the student uses the number line (by marking both of the relevant temperatures and the spaces between them) to find the temperature (-2°) at midnight (7.NS.A.1). The student completes all parts of the problem, correctly identifies the high and low temperatures in Part A, and shows the work used to find the mean temperature in Part B (MP1). While the student explains in Part C that the sum of the temperatures must equal zero, there is no indication of why this is necessary in order for the mean to equal zero (no credit for MP3). The student does not use precise mathematical notation in Parts B and C by not expressing temperatures in terms of degrees (no credit for MP6).

Total Awarded Points: 5 out of 7


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In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.


Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 $-10 + 7 = -3$
 $7 - 10 = -3$

-10 in both represents the lowest degree celsius, 7 is the high in both. -3 is the difference in the high and low.


- b. What is the mean temperature for the days shown in the chart? Show your work.

 $2 + (-8) + 3 + 7 + (-10) + (-6) + 2 + 7 + (-3) =$
 $-6 \div 9 = \left(-\frac{2}{3}\right)$

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- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.

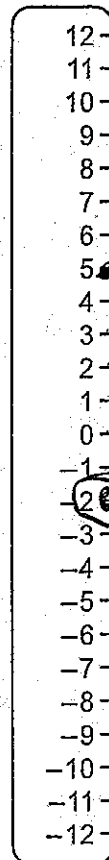


$$0 = (-6 + x) \div 10$$

$$0 = -6 + x \div 10$$

the last day would be positive
 6° celsius.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



$$\begin{array}{r} 10 \\ - 7 \\ \hline -2 \end{array}$$

-2 at midnight

Anchor 4

Litho 00307200163

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

Total Practice Points: 2 (MP1, MP3)

In Part A, the student writes two equivalent expressions, but the expressions are not appropriate to find the difference between the given numbers (no credit for 7.NS.A.1c). In Part B, the student correctly finds the mean ($-\frac{2}{3}$) for the temperatures shown in the chart (7.NS.A.3). In Part C, the student determines a temperature for the 10th day (“positive 6° celsius”) that will result in an overall sum of 0 (7.NS.A.1a). In Part D, the student uses the number line (by marking both of the relevant temperatures) to find the temperature (−2) at midnight (7.NS.A.1). The student completes all parts of the problem, correctly identifies the high and low temperatures in Part A, and shows the required work in Part B. Although the equations shown in Part A are incorrect for this task, the student has written and evaluated two expressions based on the data given in the task (MP1). The student explains in Part C why the sum of the temperatures must equal zero if the mean is to equal zero. The correct first equation is sufficient to support the student’s reasoning and outweighs the incorrect second equation in proving the point (MP3). The student does not use precise mathematical notation in Parts B and D by not expressing temperatures in terms of degrees and by using a running equation in Part B (no credit for MP6).

Total Awarded Points: 5 out of 7

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Winter in Denmark Task

In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)	
2°	1
-8°	2
3°	3
7°	4
-10°	5
-6°	6
2°	7
7°	8
-3°	9
?	10

↑ 12:00


- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.



$$7^{\circ}\text{C} + 10^{\circ}\text{C} = 17^{\circ}\text{C}$$

$$7^{\circ}\text{C} - (-10^{\circ}\text{C}) = 17^{\circ}\text{C}$$

- b. What is the mean temperature for the days shown in the chart? Show your work.



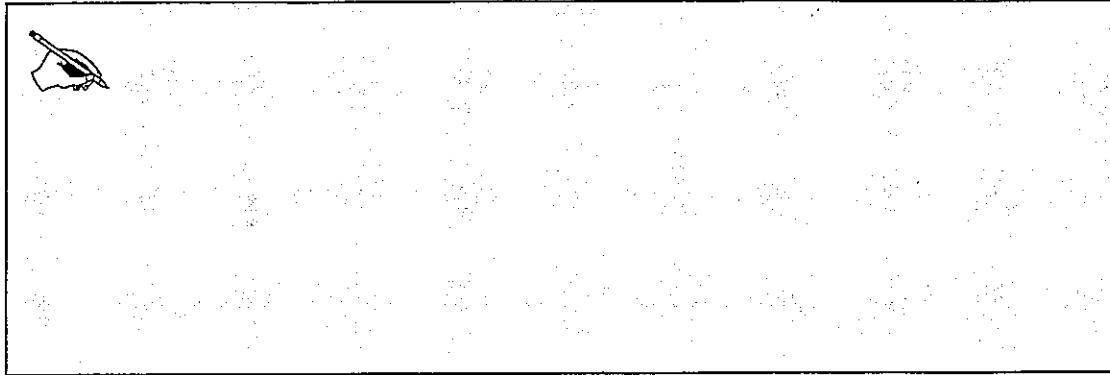
$$2 + -8 + 3 + 7 + -10 + -6 + 2 + 7 + -3$$

$$-6 \div 9 = \text{Average} = -0.\bar{6}^{\circ}\text{C}$$

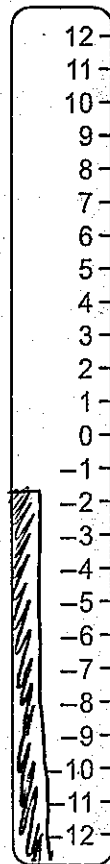
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- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.



- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



Midnight = -2°

Anchor 5

Litho 00537200163

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

Total Practice Points: 1 (MP6)

In Part A, the student writes two equivalent expressions that can be used to determine the difference between 7 and -10 (7.NS.A.1c). In Part B, the student correctly finds the mean ($-0.\bar{6}^{\circ}\text{C}$) for the temperatures shown in the chart (7.NS.A.3). The student does not determine a temperature for the 10th day that will result in an overall sum of 0 in Part C (7.NS.A.1a). In Part D, the student uses the number line (by marking both of the relevant temperatures and the spaces between them) to find the temperature (-2°) at midnight (7.NS.A.1). The student does not attempt Part C, which indicates a lack of perseverance in solving the task. This means that there is no explanation for how to find a ten-day mean of 0° (no credit for MP1, no credit for MP3). Algebraic expressions and all calculations are correct; mathematical language and notation are precise (MP6).

Total Awarded Points: 4 out of 7


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In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 My first expression is $2 + 3.5$
My second expression is $1 - 3 - 2$
This tells the difference between the highest + lowest temps which is 5.

- b. What is the mean temperature for the days shown in the chart? Show your work.

 $2 + (-8) + 3 + 7 + (-10) + 6 + 2 + 7 + (-3)$

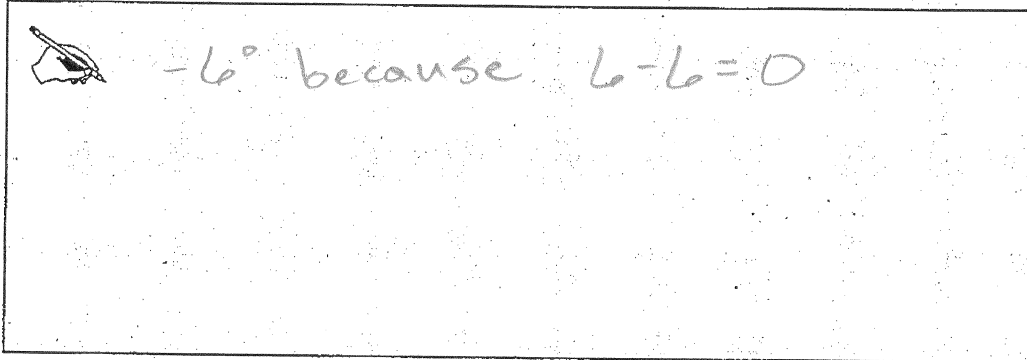
$\begin{array}{ccccccc} \diagdown & \diagup & \diagdown & \diagup & \diagdown & \diagup & \diagdown & \diagup & | \\ (-6) & + & 10 & + & (-4) & + & 9 & + & (-3) \\ & \diagdown & \diagup & \diagdown & \diagup & \diagdown & \diagup & \diagdown & | \\ & 4 & + & 5 & + & (-3) & & & \boxed{\frac{2^{\circ}}{3}} \end{array}$

4

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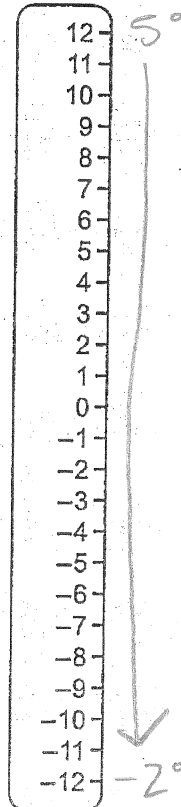
Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.



A rectangular box containing a handwritten response. On the left, there is a small drawing of a hand holding a pencil. To the right of the drawing, the text reads: -6° because $6 - 6 = 0$.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



$$5 - 7 = -2$$

Anchor 6

Litho 00097200163

Total Content Points: 2 (7.NS.A.1c, 7.NS.A.1a)

Total Practice Points: 1 (MP6)

In Part A, the student writes two equivalent expressions that can be used to determine the difference between the first and last temperatures from the given data set, rather than the highest and lowest temperatures. The expressions are equivalent and correctly show the difference between a negative and a positive number (7.NS.A.1c). The student does not correctly find the mean in Part B for the temperatures shown in the chart (no credit for 7.NS.A.3). Based on a transcription error in Part B, in Part C, the student determines a temperature for the 10th day (-6°) that will result in an overall sum of 0 (7.NS.A.1a). The student does not use the number line in Part D to find the temperature at midnight. While the student does arrive at the correct answer (-2°), the number line was not used correctly in the process (no credit for 7.NS.A.1). The student does not correctly identify the high and low temperatures in Part A (no credit for MP1). While the student explains in Part C that the sum of the temperatures must equal zero, there is no indication of why this is necessary in order for the mean to equal zero (no credit for MP3). Algebraic expressions and all calculations are correct; mathematical language and notation are precise. A degree symbol is not necessary notation in Part A, since the student is being asked to provide an expression which can be used, rather than a temperature itself (MP6).

Total Awarded Points: 3 out of 7


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Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 $y = 2 - 3$; $y = -3 + 2$

- b. What is the mean temperature for the days shown in the chart? Show your work.

 $-6 \div 9 = \left(-\frac{2}{3}\right)$


-1

2
-8
3
7
-10
-6
2
7
-3
+
-6

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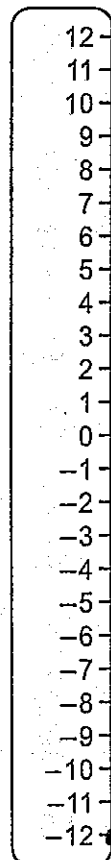
Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.



0, because if you add six to the total, 6, it equals 0 and $0.9 = 0$.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



Anchor 7

Litho 00367200163

Total Content Points: 2 (7.NS.A.3, 7.NS.A.1a)

Total Practice Points: 0

In Part A, the student writes two equivalent expressions, but they do not show the difference between 2 and -3 (no credit for 7.NS.A.1c). In Part B, the student correctly finds the mean ($-\frac{2}{3}$) for the temperatures shown in the chart (7.NS.A.3). In Part C, the student determines a temperature for the 10th day (6) that will result in an overall sum of 0 (7.NS.A.1a). The student does not use the number line in Part D to correctly find the temperature at midnight (no credit for 7.NS.A.1). The student does not correctly identify the high and low temperatures in Part A (no credit for MP1). While the student explains in Part C that the sum of the temperatures must equal zero, the statement that " $0 \cdot 9 = 0$ " is not relevant to the discussion of mean (no credit for MP3). The student does not use precise mathematical notation in Parts B, C, and D by not expressing temperatures in terms of degrees (no credit for MP6).

Total Awarded Points: 2 out of 7


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In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 $7 + 10 = 17^{\circ}$

- b. What is the mean temperature for the days shown in the chart? Show your work.


 $2 + -8 + 3 + 7 + -10 + -6 + 2 + 7 + -3 = -6 \div 9$

$-1\frac{1}{2}$

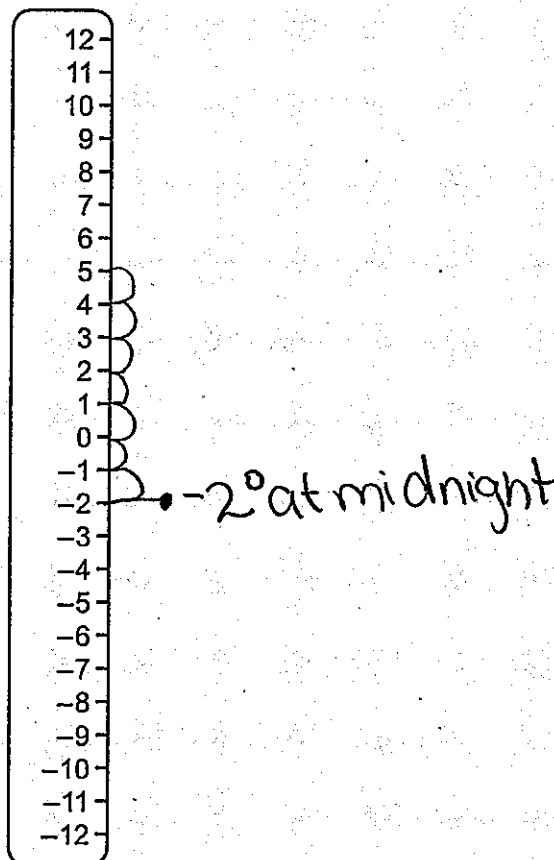
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- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.

 it needs to be 1.5°C .
Because $-1\frac{1}{2} + 1\frac{1}{2} = 0$.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



Anchor 8

Litho 00027200163

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

Total Practice Points: 0

The student does not write two equivalent expressions in Part A that can be used to determine the difference between 7 and -10 (no credit for 7.NS.A.1c). The student does not correctly find the mean in Part B for the temperatures shown in the chart (no credit for 7.NS.A.3). The student does not determine a temperature for the 10th day that will result in an overall sum of 0 in Part C (no credit for 7.NS.A.1a). In Part D, the student uses the number line (by marking both of the relevant temperatures and the spaces between them) to find the temperature (-2°) at midnight (7.NS.A.1). The student only writes one expression in Part A, which is therefore incomplete (no credit for MP1). The student does not explain in Part C that the sum of the temperatures must equal zero (no credit for MP3). The student calculates incorrectly in Part B $\left(-6 \div 9 = -1\frac{1}{2}\right)$ and does not use precise mathematical notation in Part B by not expressing temperature in terms of degrees (no credit for MP6).

Total Awarded Points: 1 out of 7


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Winter in Denmark Task

In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)
2° ✓
-8° ✓
3° ✓
7° ✓
-10° ✓
-6° ✓
2° ✓
7° ✓
-3° ✓


- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.


highest
lowest

7°
 -10°

$-10 - 7 = -17$
|
 $7 - (-10) = 17$

- b. What is the mean temperature for the days shown in the chart? Show your work.


 $-10, -8, -6, -3, 2, 2, 3, 7, 7 = -6$

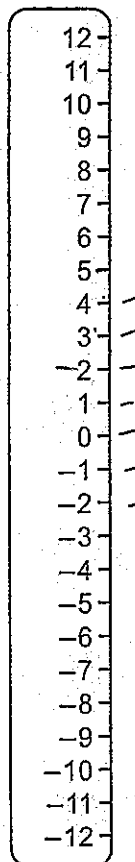
-6
 $\frac{9}{-6}$ (mean: -1.5)

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Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



-2°

Anchor 9

Litho 00627200163

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

Total Practice Points: 0

In Part A, the student writes two expressions that can be used to determine the difference between 7 and -10 , but the expressions are not equivalent (no credit for 7.NS.A.1c). The student does not correctly find the mean in Part B for the temperatures shown in the chart (no credit for 7.NS.A.3). The student does not determine a temperature for the 10th day that will result in an overall sum of 0 in Part C (no credit for 7.NS.A.1a). In Part D, the student uses the number line (by counting down from 5) to find the temperature (-2°) at midnight (7.NS.A.1). The student does not complete Part C (no credit for MP1; no credit for MP3). The student does not use precise mathematical notation in Part B by not expressing temperature in terms of degrees (no credit for MP6).

Total Awarded Points: 1 out of 7


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Constructed Response Assessment

Winter in Denmark Task


In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 $\frac{-17}{-10}$ $\frac{7}{-8}$

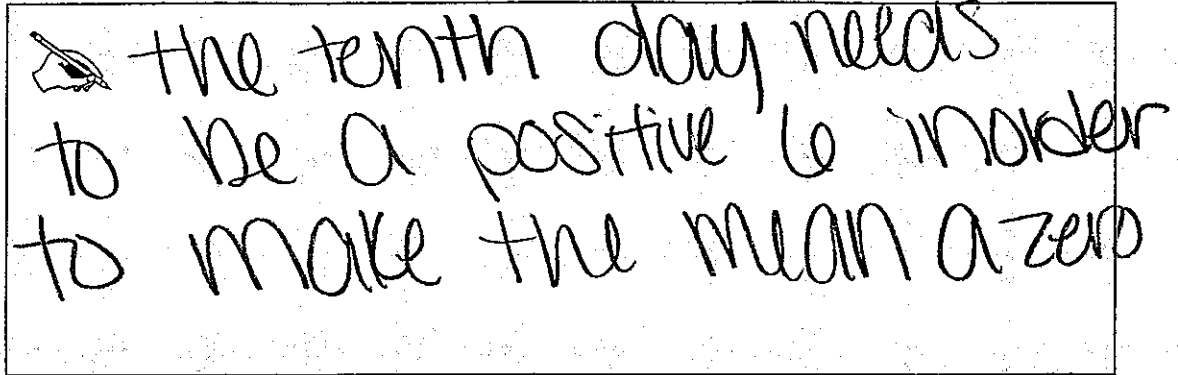
- b. What is the mean temperature for the days shown in the chart? Show your work.

 $2 + -8 + 3 + 7 + -10 + -6 + 2 + 7 + -3 = -6$ mean

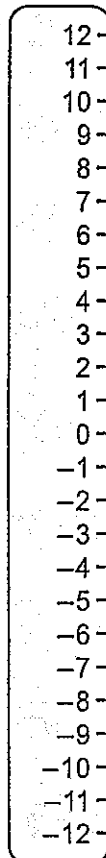
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Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.

 the tenth day needs to be a positive 6 in order to make the mean a zero

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



$$\begin{array}{r} 5 \\ -7 \\ \hline -2 \end{array}$$

It would be at negative 2, take positive 5 and subtract 7.

Anchor 10

Litho 00997200163

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

Total Practice Points: 0

The student does not write two equivalent expressions in Part A that can be used to determine the difference between two temperatures (no credit for 7.NS.A.1c). The student does not correctly find the mean in Part B for the temperatures shown in the chart (no credit for 7.NS.A.3). In Part C, the student determines a temperature for the 10th day (“positive 6”) that will result in an overall sum of 0 (7.NS.A.1a). The student does not use the number line in Part D to find the temperature at midnight. While the student does arrive at the correct answer (-2), the number line was not used in the process (no credit for 7.NS.A.1). The student does not correctly identify the high and low temperatures in Part A (no credit for MP1). While the student explains in Part C that the sum of the temperatures must equal zero, there is no indication of why this is necessary in order for the mean to equal zero (no credit for MP3). The student does not use precise mathematical notation in Parts B, C, and D by not expressing temperatures in terms of degrees (no credit for MP6).

Total Awarded Points: 1 out of 7


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Constructed Response Assessment

Winter in Denmark Task


In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.

Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 highest temp. = 7° / lowest temp. = -10
There is a 17 difference in the highest and lowest temperatures.
 $y = 7 - 10$ $y = \text{temperature difference}$

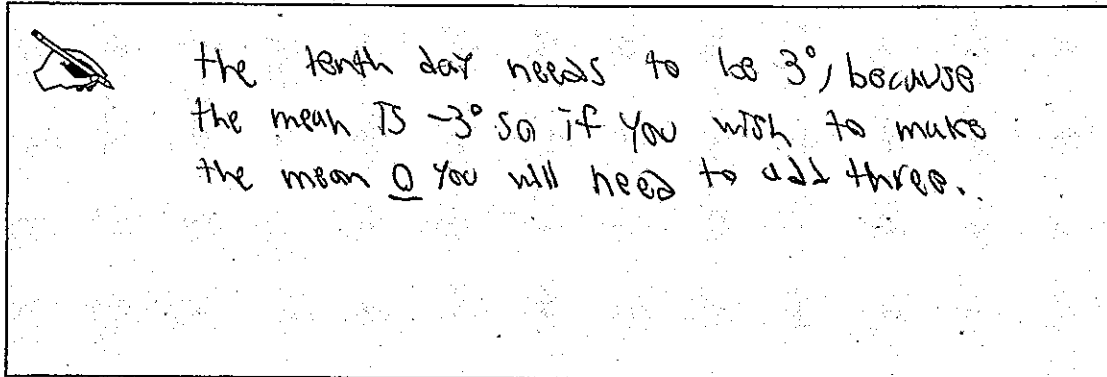
- b. What is the mean temperature for the days shown in the chart? Show your work.

 $= 10, -8, -6, -3, 2, 2, 3, 7, 7$
 \downarrow $-10 - 7 = -3^{\circ}$ \downarrow

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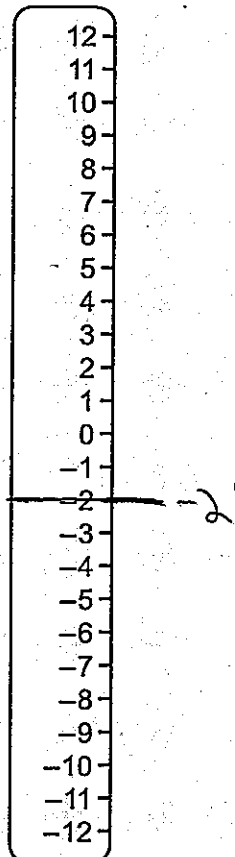
Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.



The tenth day needs to be 3° , because the mean is -3° so if you wish to make the mean 0 you will need to add three.

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



Total Content Points: 0

Total Practice Points: 0

The student does not write two equivalent expressions in Part A that can be used to determine the difference between 7 and -10 (no credit for 7.NS.A.1c). The student does not correctly find the mean in Part B for the temperatures shown in the chart (no credit for 7.NS.A.3). The student does not determine a temperature for the 10th day that will result in an overall sum of 0 in Part C (no credit for 7.NS.A.1a). The student does not use the number line in Part D to find the temperature at midnight. While the student does arrive at the correct answer (-2°) and marks that answer on the number line, there is no indication of how that answer was calculated (no credit for 7.NS.A.1). With only one equation instead of two, the student does not complete Part A (no credit for MP1). The student does not explain in Part C that the sum of the temperatures must equal zero (no credit for MP3). The student calculates incorrectly in Part B ($-10^\circ - 7^\circ = -3^\circ$) and uses imprecise mathematical language in Part A (“there is a 17 difference”) (no credit for MP6).

Total Awarded Points: 0 out of 7


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Winter in Denmark Task

In Denmark, the average monthly temperature for February is 0° Celsius. The chart below shows the temperatures for 9 days during the month, taken at noon each day.


Temperature (celsius)
2°
-8°
3°
7°
-10°
-6°
2°
7°
-3°

- a. Write and evaluate two equivalent expressions that can be used to determine the difference between the highest and lowest temperatures.

 The High Temperature many there
Hot.

The lowest Temperature are blow freeze.

- b. What is the mean temperature for the days shown in the chart? Show your work.


 $2^\circ, -8^\circ, 3^\circ, 7^\circ, -10^\circ, -6^\circ, 2^\circ, 7^\circ, -3^\circ$

-10° is the mean temperature.

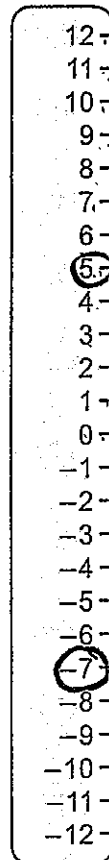
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Winter in Denmark Task

- c. What does the temperature on the tenth day need to be in order for the ten-day mean to equal 0? Explain your reasoning.

 3 BECAUSE IF YOU COULD DOWN YOU WILL HAVE 3

- d. One day the temperature was 5° at noon. It dropped 7 degrees by midnight. Use the number line below to determine the temperature at midnight.



$$\begin{array}{r} 5 \\ + \\ -7 \\ \hline -2 \end{array}$$

Total Content Points: 0

Total Practice Points: 0

The student does not write two equivalent expressions in Part A that can be used to determine the difference between two temperatures (no credit for 7.NS.A.1c). The student does not correctly find the mean in Part B for the temperatures shown in the chart (no credit for 7.NS.A.3). The student does not determine a temperature for the 10th day that will result in an overall sum of 0 in Part C (no credit for 7.NS.A.1a). The student does not use the number line in Part D to find the temperature at midnight. While the student does arrive at the correct answer (-2), the number line is not used correctly in the process (no credit for 7.NS.A.1). The student does not correctly identify the high and low temperatures or make any attempt to provide two expressions in Part A (no credit for MP1). The student does not explain in Part C that the sum of the temperatures must equal zero (no credit for MP3). The student uses imprecise mathematical language in Part A and does not use precise mathematical notation in Parts C and D by not expressing temperatures in terms of degrees (no credit for MP6).

Total Awarded Points: 0 out of 7