SECURE MATERIAL – Reader Name: _____

Tennessee Comprehensive Assessment Program

TCAP/CRA

2014

6

Phase III

Ordering Task

Anchor Set

Ordering Task

A sixth-grade math teacher gave her class the following problem:

> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 _____

6 and –6 _____

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

Scoring Guide

The CCSS for Mathematical Content (3 points)

6.NS.C.6c Accurately indicates the points on a number line. No numbers are incorrectly placed. _____
(1 Point)

6.NS.C.5 Explains that the absolute value of 6 and –6 are the same distance from zero. _____
(1 Point)

6.NS.C.7c Explains that the absolute value of a rational number is its distance from 0 on the number line.
(1 Point)

The CCSS for Mathematical Practice (2 points)

MP3 Constructs a mathematically sound argument for why the choice of neither student is correct. _____
(1 Point)
(MP3: Construct a viable argument and critique the reasoning of others.)

MP6 Writes the two absolute value inequalities, $|-4| < |-8|$ and $|6| = |-6|$, in part b. _____
(1 Point)
(MP6: Attend to precision.)

TOTAL POINTS: 5

The CCSS for Mathematical Content Addressed In This Task

Apply and extend previous understandings of numbers to the system of rational numbers.	
6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
6.NS.C.6c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
6.NS.C.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*

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.

A-1a

Ordering Task

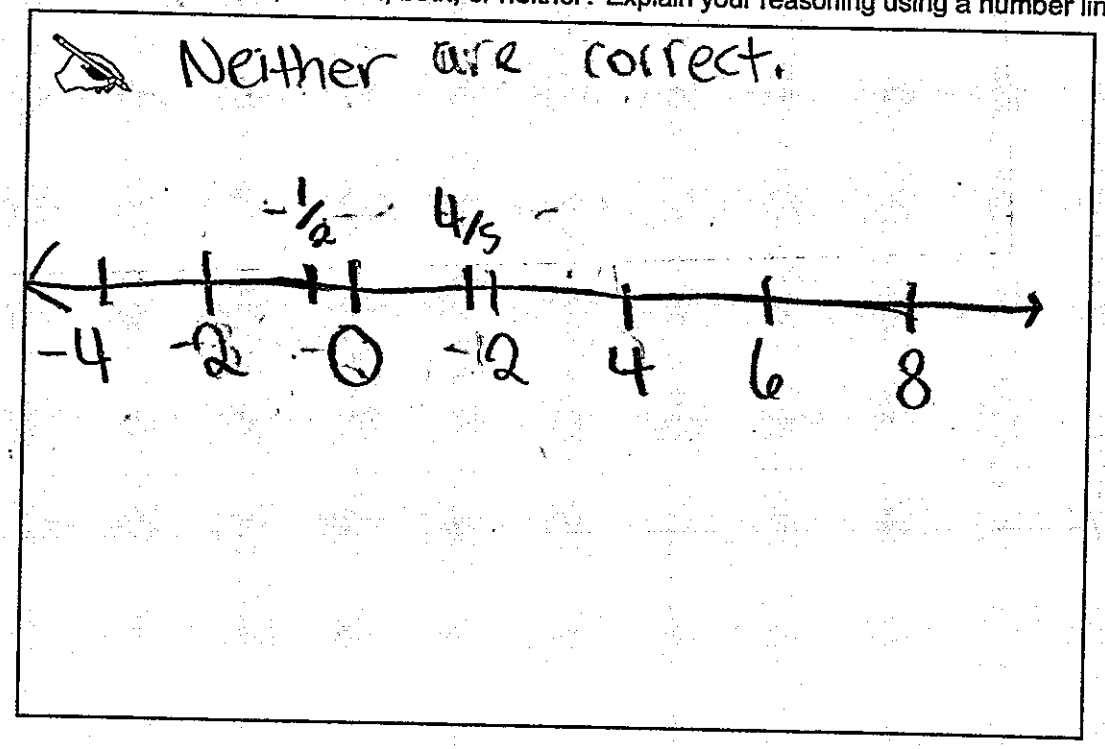
A sixth-grade math teacher gave her class the following problem:

> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.



6

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

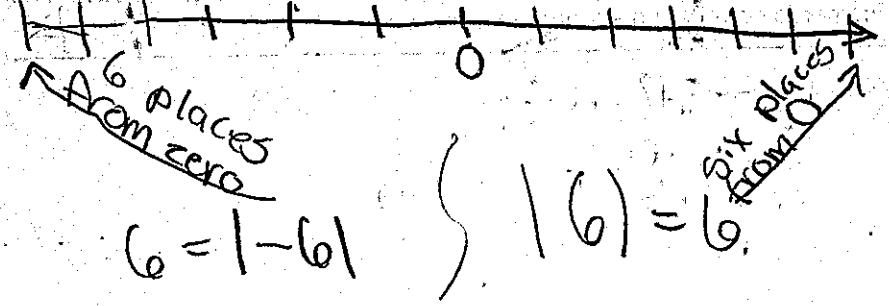
Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 $|-4| < |-8|$

6 and –6 $|6| = |6|$

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

Absolute value tells you how many places away from zero a number is located.



$6 = |-6|$ $|6| = 6$.

Anchor 1 Litho 00536200165

Total Content Points: 3 (6.NS.C.6c, 6.NS.C.5, 6.NS.C.7c)

Total Practice Points: 2 (MP3, MP6)

In Part A, the student indicates and accurately orders all given rational numbers on a number line (6.NS.C.6c). The use of the number line to correctly order the given numbers and the student's statement that "neither are correct" provide a mathematically sound argument (MP3). In Part B, the student writes two absolute value inequalities ($|–4| < |–8|$, $|–6| = |6|$) (MP6). In Part C, the student provides a number line illustrating that the absolute value of 6 and –6 are the same distance from zero (6.NS.C.5). The student also explains that the absolute value of a rational number is its distance from zero on the number line ("how many places away from zero a number is located") (6.NS.C.7c),

Total Awarded Points: 5 out of 5

Ordering Task

A sixth-grade math teacher gave her class the following problem:

> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

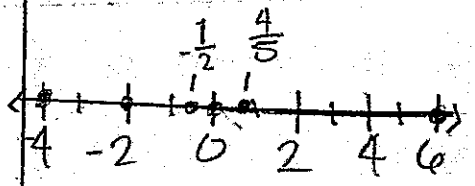
a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

$-4, -2, -\frac{1}{2}, 0, \frac{4}{5}, 6$

Neither



A-2b

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 $|-4| < |-8|$

6 and –6 $|6| = |-6|$

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

A number's absolute value represents how far away (left or right) it is from zero

Anchor 2 Litho 00026200165

Total Content Points: 2 (6.NS.C.6c, 6.NS.C.7c)

Total Practice Points: 2 (MP3, MP6)

In Part A, the student indicates and accurately orders all given rational numbers on a number line (6.NS.C.6c). The use of the number line to correctly order the given numbers and the student's answer of "neither" provide a mathematically sound argument (MP3). In Part B, the student writes two absolute value inequalities ($|–4| < |–8|$, $|–6| = |6|$) (MP6). In Part C, the student does not address that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). However, the student explains that the absolute value of a rational number is its distance from zero on the number line ("how far away . . . it is from zero") (6.NS.C.7c).

Total Awarded Points: 4 out of 5

A-3a

Ordering Task

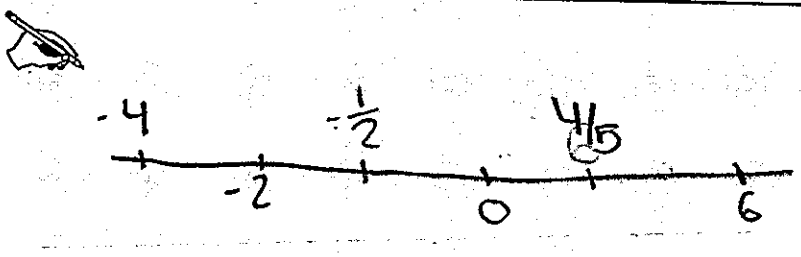
A sixth-grade math teacher gave her class the following problem:

> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.



neither are correct

Litho#: 00116200165

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 $|-4| > -8$.

6 and –6 $(6) = (-6)$

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

Shows which numbers are greater and which is lesser. If you were told to put 6 and negative 6 on a number line the absolute values would help. It shows how far away from zero the number is.

Anchor 3 Litho 00116200165

Total Content Points: 2 (6.NS.C.6c, 6.NS.C.7c)

Total Practice Points: 1 (MP3)

In Part A, although not spatially accurate, the student indicates and accurately orders all given rational numbers on a number line (6.NS.C.6c). The student's answer that "neither are correct" and the use of the number line to correctly order the given numbers provide a mathematically sound argument (MP3). In Part B, the student writes only one equality, (6) = (–6), that represents the relationship between the absolute values for the given pairs of numbers (no credit for MP6). In Part C, the student does not address that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). However, the student does explain that the absolute value of a rational number is its distance from zero on the number line ("shows how far away from zero the number is") (6.NS.C.7c).

Total Awarded Points: 3 out of 5

A-4a

Ordering Task

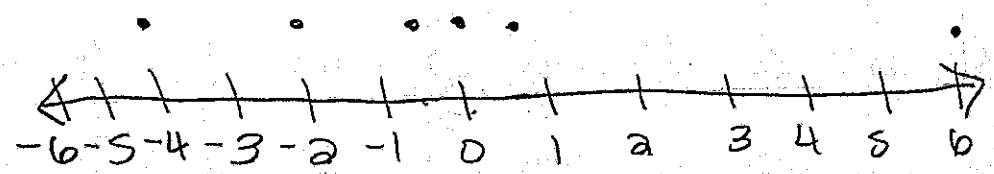
A sixth-grade math teacher gave her class the following problem:

> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.



-4, -2, -1/2, 0, 4/5, 6

neither Alisa or Bennett are correct.

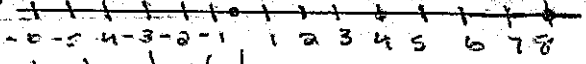
Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

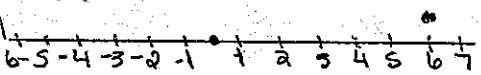
$|-4| < |-8|$

–4 and –8



$|6| = |-6|$

6 and –6



c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

Absolute value can not tell you where a number goes on a number line because the absolute value of 6 and -6 both are 6 so they be the same on a number line.

Anchor 4 Litho 00276200165

Total Content Points: 1 (6.NS.C.6c)

Total Practice Points: 2 (MP3, MP6)

In Part A, the student indicates and accurately orders all given rational numbers on a number line (6.NS.C.6c). The student's answer that "neither Alisa or Bennett are correct" and the use of the number line to correctly order the given numbers provide a mathematically sound argument (MP3). In Part B, the student writes two absolute value inequalities ($|-4| < |-8|$, $|-6| = |6|$) (MP6). In Part C, the student does not explain that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). The student also does not address that the absolute value of a rational number is its distance from zero on the number line (no credit for 6.NS.C.7c).

Total Awarded Points: 3 out of 5

A-5a

Ordering Task

A sixth-grade math teacher gave her class the following problem:

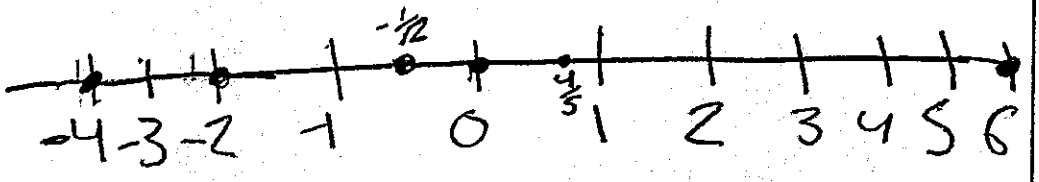
> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

Bennet and Alisa are wrong.



$-4, -2, -\frac{1}{2}, 0, \frac{4}{5}, 6$

Litho#: 00046200165

A-5b

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

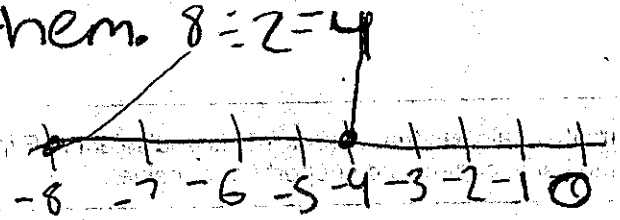
Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 8 ÷ 2 = 4

6 and –6 6 - 0 = 6

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

I shows you what order to put them. 8 ÷ 2 = 4



7

Anchor 5 Litho 00046200165

Total Content Points: 1 (6.NS.C.6c)

Total Practice Points: 2 (MP3, MP6)

In Part A, the student indicates and accurately orders all given rational numbers on a number line (6.NS.C.6c). The student's answer that "Bennet and Alisa are wrong" and the use of the number line to correctly order the given numbers provide a mathematically sound argument (MP3). In Part B, the student writes equations for each pair of numbers that represent the relationship between their absolute values, showing that the absolute value of –8 is twice that of the absolute value of –4 ($8 \div 2 = 4$) and that the absolute value of 6 is equal to the absolute value of –6 ($6 - 0 = 6$) (MP6). In Part C, the student does not address that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). The student also does not explain that the absolute value of a rational number is its distance from zero on the number line (no credit for 6.NS.C.7c).

Total Awarded Points: 3 out of 5

A-6a

Ordering Task

A sixth-grade math teacher gave her class the following problem:

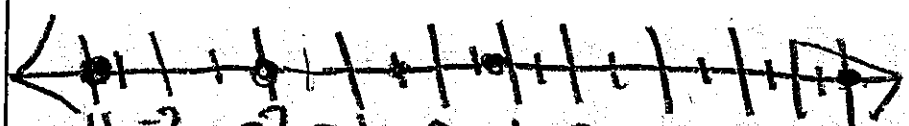
> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$
>
> 6 1 5 2 4 3

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

neither



$-4, -2, -\frac{1}{2}, 0, \frac{4}{5}, 6$

6

Ordering Task

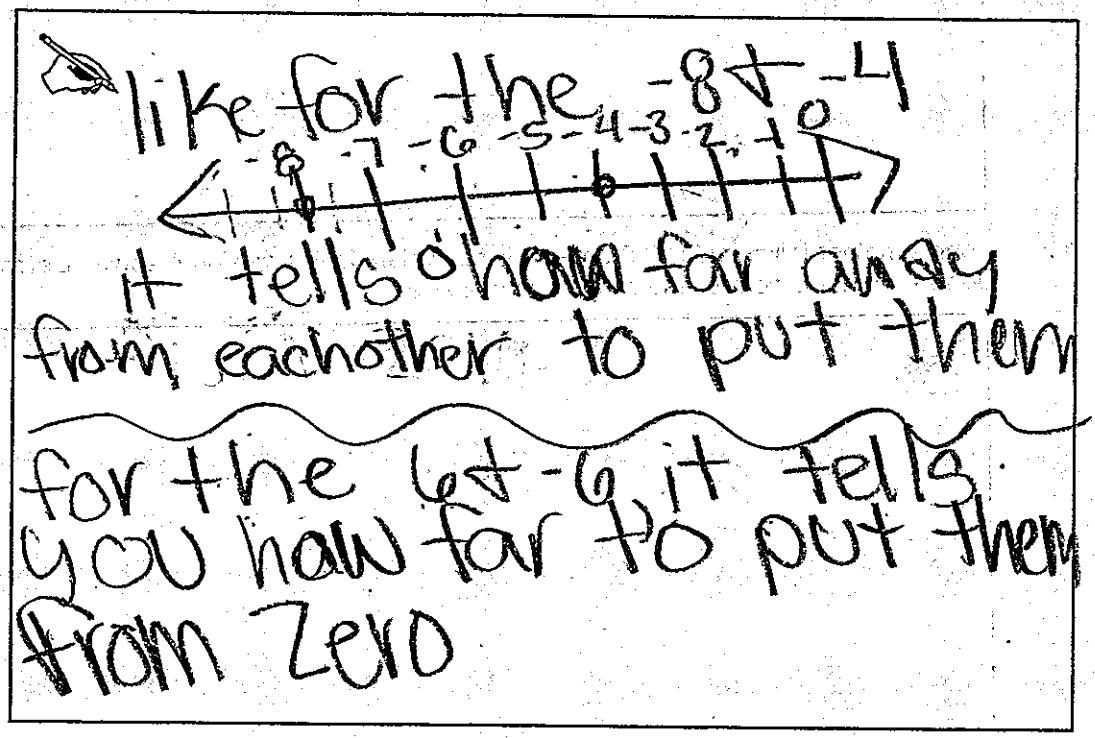
b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 4

6 and –6 6

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?



Anchor 6 Litho 00016200165

Total Content Points: 1 (6.NS.C.6c)

Total Practice Points: 1 (MP3)

In Part A, the student indicates and accurately orders all given rational numbers on a number line (6.NS.C.6c). The student's answer of "neither" and the use of the number line to correctly order the given numbers provide a mathematically sound argument (MP3). In Part B, the student does not provide any absolute value inequalities (no credit for MP6). In Part C, the student does not explain that the absolute value of 6 and –6 are the same distance from zero ("for the 6 & –6, it tells you how far to put them from zero") (no credit for 6.NS.C.5). The student also does not explain that the absolute value of a rational number is its distance from zero on a number line ("it tells how far away from each other to put them") (no credit for 6.NS.C.7c).

Total Awarded Points: 2 out of 5

A-7a

Ordering Task

A sixth-grade math teacher gave her class the following problem:

> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$
>
> .8 −.5
>
> 6 1 5 −2 4 2 3

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

Neither it should go: -
$-4, -2, -\frac{1}{2}, 0, \frac{4}{5}, 6$

Alisa is wrong because 0 comes after all negative numbers on a # line
Bennett is wrong because - when you are listing negative numbers from least to greatest the greatest # would be the least for example: -4 is less than -2

6

A-7b

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 $4 < 8$

6 and –6 $6 = 6$

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

It doesnt the signs tell you were to put them

Anchor 7 Litho 00336200165

Total Content Points: 0

Total Practice Points: 2 (MP3, MP6)

In Part A, the student does not provide a number line to accurately order all given rational numbers (no credit for 6.NS.C.6c); however, the student does construct a mathematically sound argument for the choice of neither student ("0 comes after all negative numbers on a number line"; "when you are listing negative numbers from least to greatest the greatest # would be the least; for example: –4 is less than –2") (MP3). In Part B, the student writes two inequalities that represent the relationship between the absolute values for each pair of numbers ($4 < 8$, $6 = 6$) (MP6). In Part C, the student does not explain that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). The student also does not explain that the absolute value of a rational number is its distance from zero on a number line (no credit for 6.NS.C.7c).

Total Awarded Points: 2 out of 5

A-8a

Ordering Task

A sixth-grade math teacher gave her class the following problem:

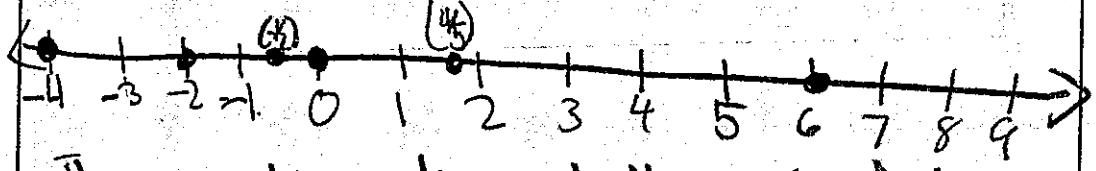
> Order the following rational numbers from least to greatest:
> $-4, -2, -\frac{1}{2}, 0, \frac{4}{5}, 6$
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

Neither are correct.



The number line tells us that the correct numerical order is, $-4, -2, -\frac{1}{2}, 0, \frac{4}{5}, 6$.

6

A-8b

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 $|-8| = |-4| + 4$

6 and –6 $|6| = |-6|$

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

It tells you how many spaces to put between each number.

Litho#: 00156200165

Anchor 8 Litho 00156200165

Total Content Points: 0

Total Practice Points: 2 (MP3, MP6)

In Part A, the student inaccurately plots the given rational numbers on a number line, placing $\frac{4}{5}$ after 1 (no credit for 6.NS.C.6c). However, the student's answer of "neither" and the correct sequencing of the given numbers on the number line provide a mathematically sound argument (MP3). In Part B, the student writes two equations that represent the relationship between the absolute values for each pair of numbers, showing that the absolute value of –4 is 4 less than the absolute value of –8 ($|–8| = |–4| + 4$), and that $|6| = |–6|$ (MP6). In Part C, the student does not explain that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). Neither does the student explain that the absolute value of a rational number is its distance from zero on a number line (no credit for 6.NS.C.7c).

Total Awarded Points: 2 out of 5

A-9a

Ordering Task

A sixth-grade math teacher gave her class the following problem:

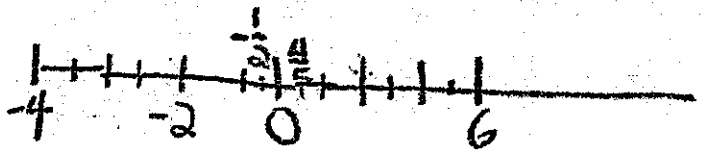
> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

Bennett is correct because negative numbers are less than 0.



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A-9b

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 $-4 > -8$

6 and –6 $6 = -6$

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

It shows which number would come first on a number line, for example, -4 is greater than -8, so -4 would be closer to zero than -8.

Litho#: 00566200165

Anchor 9 Litho 00566200165

Total Content Points: 1 (6.NS.C.6c)

Total Practice Points: 0

In Part A, the student indicates and accurately orders all given rational numbers on the number line (6.NS.C.6c); however, the student erroneously chooses Bennett as having correctly ordered the given rational numbers (no credit for MP3). In Part B, the equations the student provides do not represent the relationship between the absolute values for each given pair of numbers ($-4 > -8$, $6 > -6$) (no credit for MP6). In Part C, the student does not explain that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). The student also does not explain that the absolute value of a rational number is its distance from zero on a number line, only indicating that -4 would be closer to 0 than -8 (no credit for 6.NS.C.7c).

Total Awarded Points: 1 out of 5

Ordering Task

A sixth-grade math teacher gave her class the following problem:

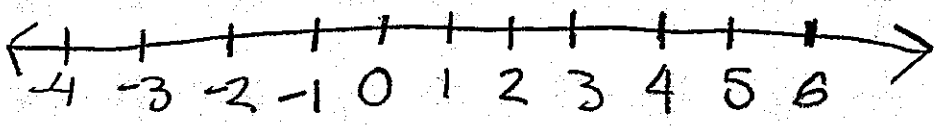
> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$
>
> 0.8 −0.5

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

neither



6

A-10b

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 4, 8

6 and –6 6, 6

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

well the absolute value of -4 = 4 so you know to put it in the negatives

Litho#: 00966200165

Anchor 10 Litho 00966200165

Total Content Points: 0

Total Practice Points: 1 (MP3)

In Part A, the student does not indicate all given rational numbers on a number line, omitting the values of $-\frac{1}{2}$ and $\frac{4}{5}$ (no credit for 6.NS.C.6c). However, the student's answer of "neither" and the correctly drawn number line showing the correct order of the rational numbers, also marked with "least" and "greatest", provide a mathematically sound argument (MP3). In Part B, the student does not provide any absolute value inequalities (no credit for MP6). In Part C, the student does not explain that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). The student also does not explain that the absolute value of a rational number is its distance from zero on a number line (no credit for 6.NS.C.7c).

Total Awarded Points: 1 out of 5

A-11a

Ordering Task

A sixth-grade math teacher gave her class the following problem:

> Order the following rational numbers from least to greatest:
>
> $6, -4, \frac{4}{5}, -2, 0, -\frac{1}{2}$

a. Alisa listed the rational numbers as follows: $0, -\frac{1}{2}, \frac{4}{5}, -2, -4, 6$

Bennett listed the rational numbers as follows: $-\frac{1}{2}, -2, -4, 0, \frac{4}{5}, 6$

Who is correct: Alisa, Bennett, both, or neither? Explain your reasoning using a number line.

They are both wrong. Alisa sais that negative numbers are bigger then 0. Bennett sais that $-\frac{1}{2}$ is smaller then negative 2. Bennett also sais that -2 is bigger then -4.

Ordering Task

b. Jorge says that the absolute value of numbers can tell you where to put the numbers on the number line.

Write an inequality or equation for each pair of numbers that represents the relationship between their absolute values.

–4 and –8 $-4 \times -1 = 4 \quad -8 \times 1 = 8$

6 and –6 $|6| = 6 \quad 6 - 12 - 6$

c. How does each inequality or equation you wrote in part b tell you where to put the numbers on a number line?

It tells me that -6 is before 0 on the number line. Same with the other number examples.

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Total Content Points: 0

Total Practice Points: 0

In Part A, the student does not provide a number line that indicates and accurately orders all given rational numbers (no credit for 6.NS.C.6c). The student's attempt to construct a mathematically sound argument to support the choice of neither student ("They are both wrong") contains an erroneous statement ("Bennett also sais that –2 is bigger then –4") (no credit for MP3). In Part B, only one of the equations the student provides represents the relationship between the absolute values for the given pair of numbers ($|–6| = 6$) (no credit for MP6). In Part C, the student does not explain that the absolute value of 6 and –6 are the same distance from zero (no credit for 6.NS.C.5). The student also does not explain that the absolute value of a rational number is its distance from zero on a number line (no credit for 6.NS.C.7c).

Total Awarded Points: 0 out of 5