NAEP Released Items Aligned to the Iowa Core

6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?

In a certain restaurant a whole pie has been sliced into 8 equal wedges. Only 2 slices of the pie remain. Three people would each like an equal portion from the remaining slices of pie. What fraction of the original pie should each person receive?

2005-12-3-14

Source: National Assessment of Educational Progress, 2005, Grade 12 Mathematics Assessment.

6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.

184 ÷ 115 =

A. 16
B. 1.625
C. 1.6
D. 0.625

2003-4-7-1

Source: National Assessment of Educational Progress, 2003, Grade 4 Mathematics Assessment.

Divide: $115\overline{)184}$

A. 0.625
B. 1.6
C. 1.625
D. 16

1990-4-9-13

Source: National Assessment of Educational Progress, 1990, Grade 4 Mathematics Assessment.

In a contest, a prize of 2.72 million dollars was split equally among 32 winners. How much money did each of the 32 winners receive?

A. $0.085
B. $62,500
C. $62,502.25
D. $85,000
E. $850,000

2007-8-9-6

Source: National Assessment of Educational Progress, 2007, Grade 8 Mathematics Assessment.

Divide:

$$15\overline{)30.45}$$

1992-12-5-3

Source: National Assessment of Educational Progress, 1992, Grade 12 Mathematics Assessment.

6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Sandwich	$2.70
Drink	$1.34
Fruit	$0.80

About how much do the sandwich, drink, and fruit cost altogether?

A. $3.00
B. $3.50
C. $4.00
D. $4.25
E. $5.00

2008-9-21-23

Source: National Assessment of Educational Progress, 2008, Age 9 Mathematics Assessment.

Add the numbers $\frac{7}{10}, \frac{7}{100}, \text{and } \frac{7}{1{,}000}$. Write this sum as a decimal.

2007-8-7-7

Source: National Assessment of Educational Progress, 2007, Grade 8 Mathematics Assessment.

Ground beef costs $2.59 per pound. What is the cost of 0.93 pound of ground beef?

A. $3.52
B. $2.78
C. $2.47
D. $2.41
E. $1.66

1990-8-9-13

Source: National Assessment of Educational Progress, 1990, Grade 8 Mathematics Assessment.

The Zandalia Zoo uses 214,964 kilograms of meat per year. If the meat costs $2.53 per kilogram, how much does the meat cost per week?

1990-8-9-17

Source: National Assessment of Educational Progress, 1990, Grade 8 Mathematics Assessment.

6.NS.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).

The least common multiple of 8, 12, and a third number is 120. Which of the following could be the third number?

A. 15
B. 16
C. 24
D. 32
E. 48

1990-8-7-12
1990-12-7-12

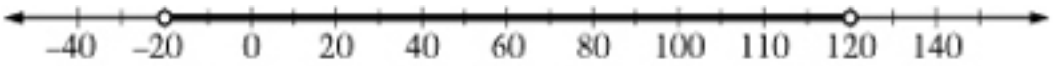
Source: National Assessment of Educational Progress, 1990, Grade 8 and Grade 12 Mathematics Assessments.

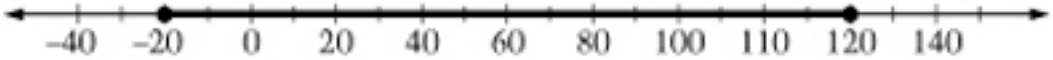
6.NS.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

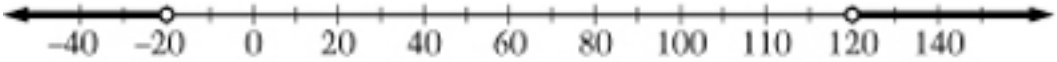
6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

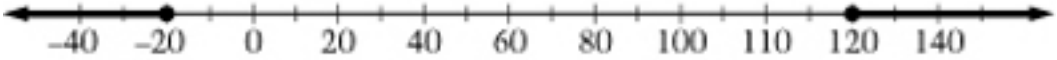
a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.
b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
c. 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.

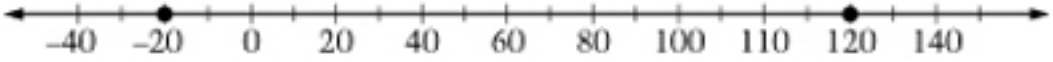
Weather records in a city show the coldest recorded temperature was -20° F and the hottest was 120° F. Which of the following number line graphs represents the range of recorded actual temperatures in this city?

A.


B.


C.


D.


E.


2007-8-7-5

Source: National Assessment of Educational Progress, 2007, Grade 8 Mathematics Assessment.

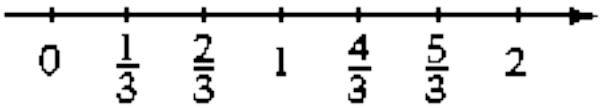
What number is represented by point *A* on the number line above?

F. 0.0010
G. 0.0054
H. 0.0055
I. 0.006
J. 0.055

2005-8-12-11

Source: National Assessment of Educational Progress, 2005, Grade 8 Mathematics Assessment.

On the number line below, place a dot at the point that could represent 1.75.



1992-12-15-3

Source: National Assessment of Educational Progress, 1992, Grade 12 Mathematics Assessment.

Which of the following is negative?

A. -(2)
B. -(-3)
C. 0
D. (-0)
E. None of the above

2004-17-23-15

Source: National Assessment of Educational Progress, 2004, Age 17 Mathematics Assessment.

Which of the following is positive?

A. $-(-31)$

B. $-(31)$

C. -31

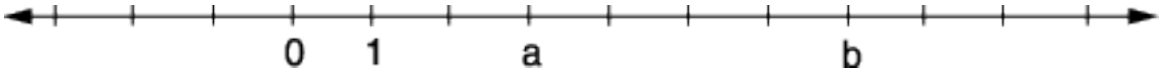
D. $0-31$

2008-17-21-11

Source: National Assessment of Educational Progress, 2008, Age 17 Mathematics Assessment.

6.NS.7 Understand ordering and absolute value of rational numbers.

a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.
b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3 ^{o}C > –7 ^{o}C to express the fact that –3 ^{o}C is warmer than –7 ^{o}C.
c. 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.
d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.



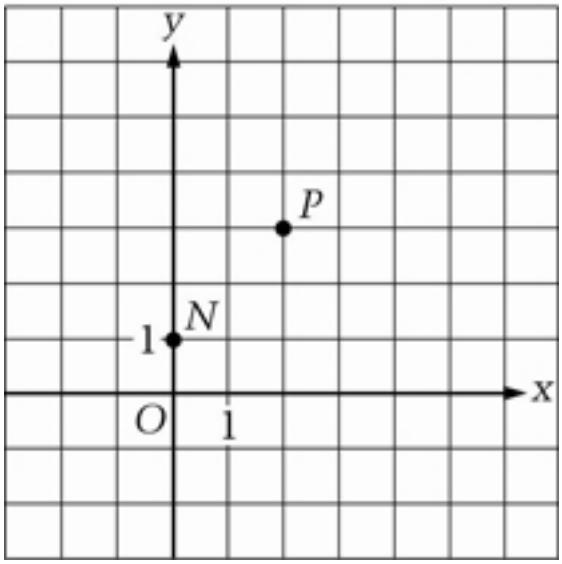
Which of the following is shown by the number line?

A. $a = b$
B. $a < b$
C. $a > b$
D. Can't tell anything about a and b

2004-17-23-22

Source: National Assessment of Educational Progress, 2004, Age 17 Mathematics Assessment.

6.NS.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.



For the figure above, which of the following points would be on the line that passes through points *N* and *P*?

A. (−2, 0)
B. (0, 0)
C. (1, 1)
D. (4, 5)
E. (5, 4)

2009-8-10-14

Source: National Assessment of Educational Progress, 2009, Grade 8 Mathematics Assessment.

In a coordinate plane, the points (2, 4) and (3, -1) are on a line. Which of the following <u>must</u> be true?

A. The line crosses the *x*-axis.
B. The line passes through (0, 0).
C. The line stays above the *x*-axis at all times.
D. The line rises from the lower left to the upper right.
E. The line is parallel to the *y*-axis.

2003-8-10-11

Source: National Assessment of Educational Progress, 2003, Grade 8 Mathematics Assessment.