



# ***New York State Testing Program***

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## **Mathematics Common Core Sample Questions**

**Grade**

**5**

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**Domain:** Operations and Algebraic Thinking

**Item:** MC

**1**

Which mathematical expression is equivalent to the number sentence below?

*Subtract 15 from 45, and then divide by 3.*

- A  $15-45 \div 3$
- B  $(45-15) \div 3$
- C  $(15-45) \div 3$
- D  $3 \div (45-15)$

**Key:** B

**Aligned CCLS:** 5.OA.2

**Commentary:** This question aligns to CCLS 5.OA.2 because the student must translate from the statement to numerical expression, without evaluation.

**Rationale:** Option B is correct because it accurately shows the subtraction of 15 from 45 and the division of that difference by 3. Option A is incorrect because it does not incorporate an understanding of order of operations. Option C is incorrect because it subtracts 45 from 15 rather than 15 from 45 as directed by the given number sentence. It is likely due to a direct adoption of the order of the numbers in the number sentence and/or a misunderstanding of “15 from 45” (45-15). Option D correctly represents the order of subtraction, but rather than dividing the difference by 3 as in Option B it incorrectly divides 3 by the difference.

**Domain:** Number and Operations in Base Ten

**Item:** MC

**2**

How many times greater is the value of the digit 5 in 583,607 than the value of the digit 5 in 362,501?

- A 10 times
- B 100 times
- C 1,000 times
- D 10,000 times

**Key:** C

**Aligned CCLS:** 5.NBT.1

**Commentary:** This question aligns with CCLS 5.NBT.1 because it requires that the student understand that the digits have different place values in the numbers provided in the stem and that the digits differ in the two numbers by a factor of 10, as place value suggests.

**Rationale:** Option C is correct. The value of 5 in 583,607 is 500,000; whereas the value of 5 in 362,501 is 500. Hence, the former is  $\frac{500,000}{500} = 1,000$  times the latter. The alternate distractors represent miscalculations or lack of understanding of place value.

**Domain:** Number and Operations in Base Ten  
**Item:** MC

**3**



Nail Type By Letter	Length (inches)
F	1.241
G	1.236
H	1.274
J	0.944
K	0.942

Based on the table above, which of the following comparisons of nail length is true?

- A  $F > H$
- B  $J < K$
- C  $J > H$
- D  $G < F$

**Key:** D

**Aligned CCLS:** 5.NBT.3

**Commentary:** This question aligns to CCLS 5.NBT.3 because it requires students to compare two decimals to thousandths based on meanings of the digits in each place, using  $>$ ,  $=$ , and  $<$ .

**Rationale:** Option D is correct because nail G is shorter than nail F. Nail G is of shorter length because while they have identical values in the ones and tenths place, nail G has a smaller value in the hundredths place. Option A could be the result of assuming that the top row in the table represents the largest value. Option B could represent an incorrect comparison of the value of two decimals starting with the thousandths place rather than the tenths place. Option C may indicate an incorrect comparison between numbers of different place values, the tenths place with the ones place.

**Domain:** Number and Operations in Base Ten

**Item:** MC

**4**

$1(10,000) + 2(1,000) + 4(100) + 3(10) + 2(1) + 5(1/10) + 3(1/100)$ .

Which number below is one-tenth of the expanded form above?

- A 12422.53
- B 1243.253
- C 12432.53
- D 12432.43

**Key:** B

**Aligned CCLS:** 5.NBT.3a and 5.NBT.2

**Commentary:** This question aligns with CCLS 5.NBT.3a and 5.NBT.2 because it requires students to write decimals in equivalent forms and apply understanding of place value.

**Rationale:** Option B is correct.

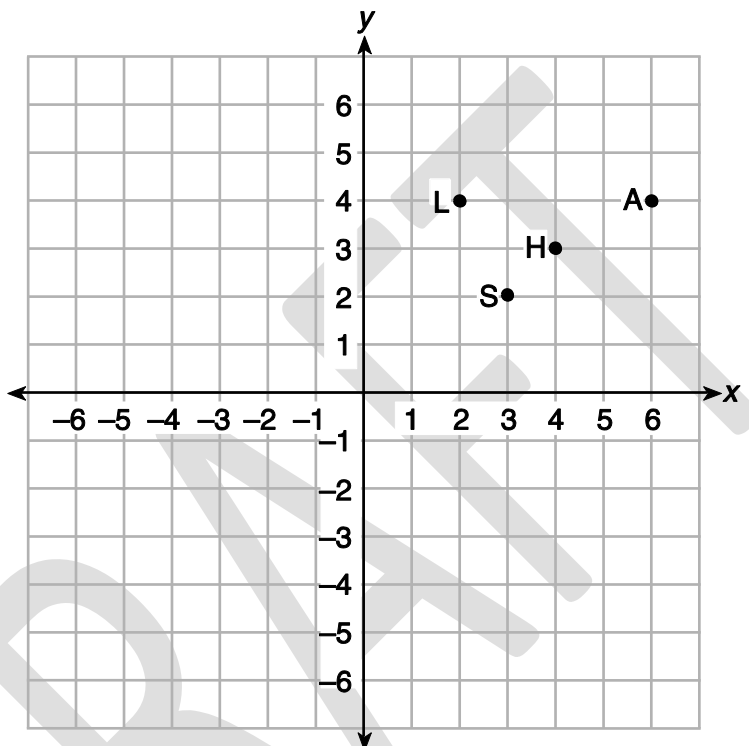
$1(10,000) + 2(1,000) + 4(100) + 3(10) + 2(1) + 5(1/10) + 3(1/100)$  in standard form is written as 12432.53. One-tenth of this value moves the decimal point one position to the left to yield 1243.253. Option A indicates an incorrect change in the tens place (decreasing the digit in the tens place by one) rather than finding one-tenth of the number. Option C is the correct form of the original number in standard form, but does not include the movement of the decimal to represent one-tenth of the given number. Option D involves no movement of the decimal and incorrectly changes the digit in the tenths place rather than taking one-tenth of the number.

**Domain:** Geometry

**Item:** MC

**5**

The graph below represents the location of four scientists collecting samples of different species of plants. Dr. Schmidt is located at (3, 2), Dr. Hodge is located at (4, 3), Dr. Alvarez is located at (6, 4), and Dr. Logan is located at (2, 4). If they want to collect one more sample from plants located at (3, 6), which scientist is the closest?



- A Dr. Hodge
- B Dr. Schmidt
- C Dr. Alvarez
- D Dr. Logan

**Key:** D

**Aligned CCLS:** 5.G.2

**Commentary:** This question aligns to CCLS 5.G.2 and assesses the student's ability to graph points in the first quadrant and to interpret the coordinate values of the points in the context of the situation.

**Rationale:** Option D is the correct answer because Dr. Logan is the closest to the position (3,6). Selecting Option C could indicate an incorrect plotting of the point (3,6) as (6,3), which would place Dr. Alvarez closer. Selecting Option B could indicate a false assumption about the proximity of the two coordinates due to their sharing an x-value.

Selecting Option A could indicate a false assumption about Dr. Hodge’s central location, that he is the closest to each of the other scientists.

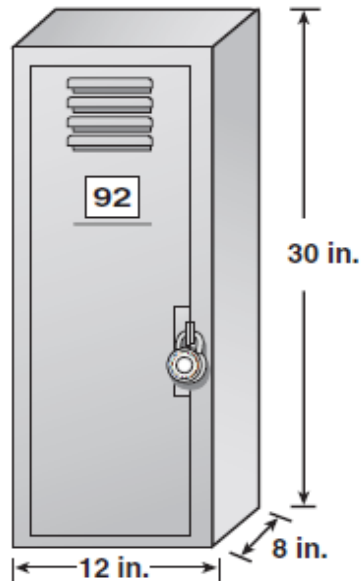
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**Domain:** Measurement and Data

**Item:** MC

**6**

What is the volume, in cubic inches, of the school locker below?



- A 2880 cubic inches
- B 2580 cubic inches
- C 390 cubic inches
- D 360 cubic inches

**Key:** A

**Aligned CCLS:** 5.MD.5b

**Commentary:** This question aligns to CCLS 5.MD.5b and assesses the student's ability to apply the formula to find the volume of a rectangular prism in a real-world context.

**Rationale:** Option A is correct. It shows correct application of the volume formula ( $12 \times 8 \times 30 = 2880$ ). Option B is incorrect and would result from incorrect multiplication of each of the dimensions of the locker. Option C is incorrect as a result of using the incorrect operations. Option D is incorrect and would result from the student using the area formula for a rectangle.



**Domain:** Number and Operations—Fractions

**Item:** MC

**7**

Which equation below gives the correct value of the following sum?

$$\frac{3}{8} + \frac{14}{12}$$

**A**  $\frac{3}{8} + \frac{7}{6} = \frac{10}{14}$

**B**  $\frac{9}{24} + \frac{28}{24} = \frac{37}{24}$

**C**  $\frac{3}{12} + \frac{14}{12} = \frac{17}{12}$

**D**  $\frac{3}{8} + \frac{14}{12} = \frac{17}{20}$

**Key:** B

**Aligned CCLS:** 5.NF.1

**Commentary:** This question aligns to CCLS 5.NF.1 and assesses the student’s ability to add fractions with unlike denominators.

**Rationale:** Option B correctly represents the creation of equivalent fractions as well as the addition of fractions with now similar denominators. Selecting Option A suggests that addition of fractions is accomplished by adding numerators together and denominators together. Selecting Option C indicates an awareness of the need for like denominators, but does not create equivalent fractions to achieve like denominators. Selecting Option D suggests that addition of fractions is accomplished by adding numerators together and denominators together.

**Domain:** Measurement and Data

**Item:** CR

**8**

Carson needs to purchase 5.6 meters of tape for a project. If each roll of tape contains 80 cm and costs \$5, what is the total cost of the tape that Carson must buy?

**Show all work.**

**Answer:** \$ \_\_\_\_\_

**Key:**

560 centimeters  $\div$  80 cm = 7 rolls

7 rolls  $\times$  \$5 per roll = \$35

**Aligned CCLS:** 5.MD.1

**Commentary:** This item is aligned to CCLS 5.MD.1 and assesses the student's ability to convert among different-sized standard measurement units (meters to centimeters), and use the conversion in solving multi-step, real-world problems.

**Rationale:** The original 5.6 meters may be multiplied by a factor of 100 (to represent the 100 centimeters that compose each meter) in order to achieve similar units throughout the following calculations (cm may be converted into meters as well). To determine the number of rolls needed, 560 cm is divided by the 80 cm per roll to yield 7 rolls. The total cost is the number of rolls needed, 7, times the price per roll, \$5. The total cost of 5.6 meters is \$35.

**Domain:** Number and Operations—Fractions

**Item:** CR

**9**

Half of a school auditorium is needed to seat 3 equal-sized fifth grade classes.

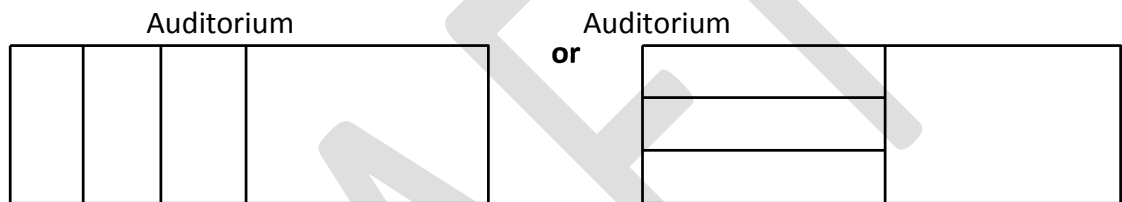
**Part A:** Make a visual fraction model to represent the whole auditorium when each class is seated in separate sections.

**Part B:** Write an expression to determine what fractional part of the auditorium one fifth grade class will need.

**Part C:** What fraction of the auditorium will one of the fifth grade classes need?

**Key:**

**Part A:**



or equivalent model.

**Part B:**  $\frac{1}{2} \div 3$  or  $\frac{1}{2} \times \frac{1}{3}$

**Part C:**  $\frac{1}{6}$

**Aligned CCLS:** 5.NF.7c

**Commentary:** This question is aligned to CCLS 5.NF.7c and assesses a student's ability to solve a real-world problem involving the interpretation of division of a unit fraction by a non-zero whole number and computation of the quotient.

**Rationale:**

**Part A:** The correct answer correctly divides the auditorium in halves, and then divides one half into thirds (or other equivalent models).

**Part B:** A correct response illustrates the ability to represent a real-world problem using a mathematical expression, recognizing the dividend as  $\frac{1}{2}$  (auditorium) and the divisor as

3 (classes), and to perform the proper computation of  $\frac{1}{2} \div 3$  or  $\frac{1}{2} \div \frac{1}{3}$ . The expression should be computed to arrive at  $\frac{1}{2} \times \frac{1}{3}$ .

**Part C:** The student uses the visual model or expression to determine the fractional part of the auditorium needed by one fifth grade class,  $\frac{1}{6}$ .



# Grade 5

# Mathematics

# Common Core Sample Questions

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