CCLS-aligned Grade 6 Math
Spring Benchmark - NYS Sequence
Test Directions

Today you will take the Mathematics Benchmark Assessment. Read each question carefully and decide which answer is correct. Using your scan sheet, fill in the bubble that contains the letter for the answer you choose. For constructed response questions, write your answer in the space provided in the booklet.
1. A starfish is attached to a rock 3 inches below the level of the water at high tide. At low tide, the starfish is 1 inch above the level of the water. Which relationship shows the starfish’s position, in relation to the level of the water, at high tide compared with its position at low tide?

   A  3 to 1  
   B  3 to 4  
   C  −3 to 4  
   D  −3 to 1

2. Which expression is equivalent to $2 \times 2 \times 2 \times 5 \times 5$?

   A  $2^3 \times 5^2$  
   B  $2^2 \times 5^3$  
   C  $3^2 \times 2^5$  
   D  $2^6 \times 5^{10}$

3. What is the opposite of the opposite of 2.5 and −5?

   A  2.5, 5  
   B  −2.5, 5  
   C  2.5, −5  
   D  −2.5, −5
4. Which expression describes the statement, "take 6.5 away from w"?

A  $6.5w$
B  $w - 6.5$
C  $6.5 - w$
D  $w + 6.5$

5. Look at the inequality below.

$2 > -3$

Which statement describes the positions of the numbers in the inequality above on a horizontal number line?

A  On a number line, both numbers are to the left of 0.
B  On a number line, both numbers are to the right of 0.
C  On a number line, $-3$ is to the left of 0 and 2 is to the right of 0.
D  On a number line, $-3$ is to the right of 0 and 2 is to the left of 0.

6. Which expression is equivalent to $4(p + r) - 2p$?

A  $2p + r$
B  $6p + 4r$
C  $2p + 4r$
D  $-4p + 4r$
7. Sean plots points $P$ and $Q$ on a coordinate plane. The coordinates of $Q$ are $(3, 2)$. $P$ is the same distance from the origin as $Q$, but both of $P$’s coordinates are negative. Which coordinate plane shows the point $P$ that Sean plots?

- **A**
- **B**
- **C**
- **D**
8. The volume of a cube can be calculated using the formula \( V = s^3 \), where \( s \) is the side length. What is the volume of a cube with a side length of \( \frac{1}{3} \) of a meter?

A \( \frac{1}{3} \) of a cubic meter

B \( \frac{1}{6} \) of a cubic meter

C \( \frac{1}{9} \) of a cubic meter

D \( \frac{1}{27} \) of a cubic meter

9. The temperature at which water freezes is 32 °F. Mercury freezes at approximately –38 °F. Which inequality compares the temperatures at which water and mercury freeze?

A \( 32 < 38 \)

B \( 32 > –38 \)

C \( 32 < –38 \)

D \( –32 < –38 \)

10. Which expression is equivalent to the expression \( 5(2x + 3) + (2 + x) \)?

A \( 3x + 5 \)

B \( 11x + 5 \)

C \( 11x + 17 \)

D \( 15x + 25 \)
11. Which letters show the locations of \(-1\frac{1}{2}\) and \(2\frac{3}{4}\) on the number line below?

\[\text{S Q R V T U}\]

\[\text{-3 -2 -1 0 1 2 3}\]

A  \( R = -1\frac{1}{2} \) and \( S = 2\frac{3}{4} \)

B  \( Q = -1\frac{1}{2} \) and \( U = 2\frac{3}{4} \)

C  \( T = -1\frac{1}{2} \) and \( S = 2\frac{3}{4} \)

D  \( V = -1\frac{1}{2} \) and \( U = 2\frac{3}{4} \)

12. A student buys a special pass for $20.00 to ride any ride at the carnival for the day. The student is at the carnival for \( h \) hours. Which expression can be used to find the cost of the special pass per hour?

A  \( 20 \times h \)

B  \( 20 - h \)

C  \( 20 \div h \)

D  \( 20 + h \)
13. Which of these shows a value of $x$ that makes the inequality true?

$$(x - 5) \div 6 < 2$$

A $x = 6$

B $x = 17$

C $x = 42$

D $x = 60$

14. On a number line, ant A is 5 units to the left of 0 and ant B is 2 units to the right of 0. Which statement correctly compares the distance between ant A and ant B?

A $|5| - |2| = 3$ units apart

B $-|5| + |2| = 3$ units apart

C $|-5| + |2| = 7$ units apart

D $|5| + (-|2|) = 7$ units apart

15. Find the total volume of two cubes if each cube has sides of length, $s = (x + 1)$ meters, when $x = 3$.

$$V = s^3$$

A 32 cubic meters

B 54 cubic meters

C 64 cubic meters

D 128 cubic meters
16. Which statement describes the positions of P (−7 1/2) and Q, (−9) compared to position of W on the number line?

![Number Line Diagram]

A  P is to the left of W and Q is to the left of P.
B  Q is to the left of W and P is to the left of Q.
C  P is to the right of W and Q is to the right of P.
D  Q is to the right of W and P is to the right of Q.

17. Which expression is equivalent to 2(4x + 5)?

A  6x + 7
B  8x + 5
C  8x + 10
D  2x + 2.5

18. Which pair of expressions are equivalent?

A  8(2x + 3) and 4(4x + 24)
B  4(4x + 6) and 8(2x + 24)
C  2(8x + 12) and 8(2x + 3)
D  2(8x + 24) and 4(4x + 24)
19. Derek earned 94% out of 100% on a science test. When he received his test back, he saw a minus 17 at the top of his test. The inequality below shows the relationship between the number of points Derek thought he lost to the number of points he actually lost.

\[-17 < -6\]

Derek’s teacher offered several extra credit points on the test, but did not report how many extra credit points were gained at the top of each test. Which statement compares Derek’s score to the number of points lost?

A Derek scored a 71%, but received 23 extra credit points for an overall score of 94%.
B Derek scored a 77%, but received 17 extra credit points for an overall score of 94%.
C Derek scored an 88%, but received 6 extra credit points for an overall score of 94%.
D Derek scored an 83%, but received 11 extra credit points for an overall score of 94%.

20. A parking garage charges customers an hourly rate to park their cars. The cost of parking a car for 8 hours is $14.00. Which expression can be used to calculate the total cost to park a car in the parking garage at the same hourly rate for \( t \) hours?

A \((14 \times 8) \div t\)
B \((14 \times 8) \times t\)
C \((14 \div 8) \times t\)
D \((8 \div 14) \times t\)
21. A total of $5^4$ votes were cast to select the second runner-up, the first runner-up, and the winner of a singing competition. The second runner-up received 118 votes. The first runner-up received 160 votes. What is the total number of votes the winner received?

A 347
B 583
C 667
D 903

22. What are the coordinates of $P$ on the coordinate grid below?

A (5, 3)
B (−5, 3)
C (5, −3)
D (−5, −3)
23. Which expression is equivalent to $4x + 3z + 5y + 3x + y$?

A  $13y + 3z$
B  $10x + 6y$
C  $7x + 6y + 3z$
D  $7x + 5y + 3z$

24. What is the value of $2^3 + 4m \div 2$ when $m = \frac{3}{2}$?

A  4
B  7
C  9
D  11
If you are taking this assessment in **one session**, please turn the page and **continue working**.

If you are taking this assessment in **two sessions**, please **stop here**.
25. Emma says that only \( x = 2 \) makes the equation below true, but Allie says only \( x = 4 \) makes it true.

\[(x + 12) \div 2 = 8\]

Using substitution, which value(s) of \( x \) make the equation true?

A. Only 2  
B. Only 4  
C. Both 2 and 4  
D. Neither 2 nor 4

26. Which expression represents “8 less than the product of 12 and the sum of 2 and \( y \)”?

A. \( 8 - 12 + 2 + y \)  
B. \( 12 \times 2 + y - 8 \)  
C. \( 12 \times (2 + y) - 8 \)  
D. \( 8 - 12 \times (2 + y) \)
27. Anne wants to join five pieces of paper together. She plans to use 3 rectangular pieces of the same size and 2 square pieces of the same size. The length of each rectangular piece is \(3\frac{1}{2}\) feet. The width of each rectangular piece, \(w\), is the same as the length of each square piece. The expression below can be used to find the total surface area of the five pieces of paper.

\[
3\left(3\frac{1}{2} \times w\right) + 2(w^2)
\]

Anne decides that the width, \(w\), of the rectangular pieces should be 2 feet. What is the total surface area, in square feet, of all five pieces of paper? *Show your work.*

\[
\text{square feet}
\]
28. The map below shows a portion of a bicycling trail along a lake on a coordinate grid.

Part A

Grace started bicycling at point $E$. She rested at the point with coordinates $(4, -2)$. On the map given, plot the point at which Grace rested, and label it $R$.

Part B

Grace stopped bicycling at a point with coordinates $(4, -8)$. If each square on the grid represents 1 kilometer, what is the distance, in kilometers, between point $E$ and the point at which Grace stopped bicycling?

_________________________ kilometers
29. Clarise was asked to simplify the expression below.

\[ 6 \times y + y \times 4 \]

She performed the following steps and claimed that she had generated an equivalent expression.

**Step 1.** \[ 6y + y \times 4 \]

**Step 2.** \[ 7y \times 4 \]

**Step 3.** \[ 28y \]

Part A

Using \( y = 2 \), explain why Clarise is incorrect.

Part B

Write an expression with one term that is equivalent to the expression Clarise was asked to simplify.

**Answer**

Part C

Using \( y = 2 \), explain why the expression you wrote is correct.
30. **Part A**

   \( P \) represents the number \( 3 \frac{1}{4} \). \( Q \) represents the number that is opposite of \( -2 \frac{1}{2} \). Plot the points \( P \) and \( Q \) on the number line given below.

![Number Line](image)

**Part B**

(1) The coordinates of vertices \( L \) and \( M \) are \( L \left(-\frac{1}{2}, 2\right) \) and \( M \left(1\frac{1}{2}, \frac{1}{2}\right) \). These vertices, combined with vertex \( N \), form right triangle \( LMN \). Plot vertex \( L \) and vertex \( M \) on the grid below.

![Grid with Points](image)

(2) The coordinates of \( N \) are in quadrant III. Using the grid from part B1, plot vertex \( N \) and draw \( \triangle LMN \).

**Part C**

What are the coordinates of \( L' \) if vertex \( L \) is reflected across the \( x \)-axis?

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*Answer* ____________________________
31. Part A

Using only two terms, write an expression that is equivalent to $2x + 3(x + 2)$. *Show your work.*

*Answer ____________________________*

Part B

Write two different expressions that are equivalent to $4 + 3y + (7y + 6)$, and explain why the two expressions are equivalent.

__________________________________________

__________________________________________

__________________________________________
32. The coordinate grid below shows one side, $\overline{LO}$, of the parallelogram $LMNO$.

$\overline{LM}$ is another side of parallelogram $LMNO$ with $M$ lying in Quadrant I. $\overline{LM}$ is a horizontal line and has a length of 6 units.

Part A

(1) What are the coordinates of vertex $L$?

Coordinates of $L$ _______________

(2) What are the coordinates of vertex $M$?

Coordinates of $M$ _______________
Part B
Using the coordinates of vertex $O$ on the grid, explain how to find the coordinates of vertex $N$.

Part C
Plot vertices $M$ and $N$ and draw the parallelogram on the coordinate grid.