You may write on this test

HIGH SCHOOL EXIT EXAM MATHEMATICS DIAGNOSTIC TEST

No Calculators

Name: ________________________ Math Teacher: ________________________ Period: ________________________

Directions: Complete the information on your answer sheet. Your math teacher will receive your results from this diagnostic test and will give them to you. This could be used as a grade for you in your math class. The results will be used to help you prepare for the High School Exit Exam that you will take next year. Each question includes the identified standard that is being tested.

1. Number Sense, Grade 7
   The radius of the earth’s orbit is 150,000,000,000 meters. What is the number in scientific notation?
   A. $1.5 \times 10^{-11}$
   B. $1.5 \times 10^{11}$
   C. $15 \times 10^{10}$
   D. $150 \times 10^9$

2. Number Sense, Grade 7
   \[
   \frac{11}{12} - \left( \frac{1}{3} + \frac{1}{4} \right) =
   \]
   A. $\frac{1}{3}$
   B. $\frac{3}{4}$
   C. $\frac{5}{6}$
   D. $\frac{9}{5}$

3. Number Sense, Grade 7
   Some students attend school 180 of the 365 days in a year. About what part of the year do they attend school?
   A. 18%
   B. 50%
   C. 75%
   D. 180%

4. Number Sense, Grade 7
   The price of a calculator has decreased from $12.00 to $9.00. What is the percent of decrease?
   A. 3%
   B. 25%
   C. 33%
   D. 75%

5. Number Sense, Grade 7
   A CD player regularly sells for $80. It is on sale for 20% off. What is the sale price of the CD player?
   A. $16
   B. $60
   C. $64
   D. $96

6. Number Sense, Grade 7
   Which number equals $(2)^{-4}$?
   A. $-8$
   B. $-\frac{1}{16}$
   C. $\frac{1}{16}$
   D. $\frac{1}{8}$

7. Number Sense, Grade 7
   Which of the following is equivalent to $7^{-6} \cdot 7^4$?
   A. $7^{-24}$
   B. $7^{-10}$
   C. $7^{-2}$
   D. $7^2$

8. Number Sense, Grade 7
   The square root of 150 is between
   A. 10 and 11
   B. 11 and 12
   C. 12 and 13
   D. 13 and 14
9. Probability and Stats, Grade 6
Donald priced six personal Compact Disc (CD) players. The prices are shown below.

$21.00, $23.00, $21.00, $39.00, $25.00, $31.00

What is the median price?
A. $21.00
B. $24.00
C. $27.00
D. $30.00

10. Probability and Stats, Grade 6
Rico’s first three test scores in biology were 65, 90, and 73. What was his mean score?
A. 65
B. 73
C. 76
D. 90

11. Probability and Stats, Grade 6
A bucket contains 3 bottles of apple juice, 2 bottles of orange juice, 6 bottles of tomato juice, and 8 bottles of water. If Kira randomly selects a bottle, what is the probability that she will select a drink other than water?
A. \(\frac{3}{4}\)
B. \(\frac{11}{19}\)
C. \(\frac{8}{19}\)
D. \(\frac{1}{4}\)

12. Probability and Stats, Grade 6
A bag contained four green balls, three red balls, and two purple balls. Jason removed one purple ball from the bag and did not put the ball back in the bag. He then randomly removed another ball from the bag. What is the probability that the second ball Jason removed was purple?
A. \(\frac{1}{36}\)
B. \(\frac{1}{9}\)
C. \(\frac{1}{8}\)
D. \(\frac{2}{9}\)

13. Probability and Stats, Grade 7
The circle graph shown above represents the distribution of the grades of 40 students in a certain geometry class. How many students received As or Bs?
A. 6
B. 10
C. 15
D. 20

14. Probability and Stats, Grade 7
Speed of Four Runners
In a 100-Meter Dash

Based on the bar graph shown above, which of the following conclusions is true?
A. Everyone ran faster than 6 meters per second.
B. The best possible rate for the 100-meter dash is 5 meters per second.
C. The first-place runner was four times as fast as the fourth-place runner.
D. The second-place and third-place runners were closest in time to one another.
15. *Probability and Stats, Grade 7*

**Ticket Prices to Funland**

The cost of a ticket to Funland varies according to the season. Which of the following conclusions about the number of tickets purchased and the cost per ticket is best supported by the scatterplot above?

A. The cost per ticket increases as the number of tickets purchased increases.
B. The cost per ticket is unchanged as the number of tickets purchased increases.
C. The cost per ticket decreases as the number of tickets purchased increases.
D. There is no relationship between the cost per ticket and the number of tickets purchased.

16. *Algebra and Functions, Grade 7*

Divide a number by 5 and add 4 to the result. The answer is 9.

Which of the following equations matches these statements?

A. \[ 4 = 9 + \frac{n}{5} \]
B. \[ \frac{n}{5} + 4 = 9 \]
C. \[ \frac{5}{n} = 4 \]
D. \[ -\frac{n + 4}{5} = 9 \]

17. *Algebra and Functions, Grade 7*

If \( h = 3 \) and \( k = 4 \), then \( \frac{hk + 4}{2} - 2 = \)

A. 6
B. 7
C. 8
D. 10

18. *Algebra and Functions, Grade 7*

The cost of a long distance call charged by each of two telephone companies is shown on the graph below.

Company A is less expensive than Company B for

A. all calls.
B. 3 minute calls only.
C. calls less than 3 minutes.
D. calls longer than 3 minutes.

19. *Algebra and Functions, Grade 7*

What does \( x^5 \) equal when \( x = -2? \)

A. \(-32\)
B. \(-10\)
C. \(-\frac{1}{32}\)
D. 32

20. *Algebra and Functions, Grade 7*

Simplify the expression shown below.

\[ (6a^4bc)(7ab^3c) \]

A. \( 13a^5b^3c \)
B. \( 13a^5b^4c^2 \)
C. \( 42a^4b^3c \)
D. \( 42a^5b^4c^2 \)
21. **Algebra and Functions, Grade 7**

Which of the following could be the graph of \( y = x^3 \)?

A.  

B.  

C.  

D.  

22. **Algebra and Functions, Grade 7**

The slope of the line shown below is \( \frac{2}{3} \).

What is the value of \( d \)?

A. 3  
B. 4  
C. 6  
D. 9

23. **Algebra and Functions, Grade 7**

What is the equation of the graph shown below?

A. \( y = x - 1 \)  
B. \( y = x + 1 \)  
C. \( y = x + 3 \)  
D. \( y = x - 3 \)
24. *Algebra and Functions, Grade 7*

Robert's toy car travels at 40 centimeters per second (cm/sec) at high speed and 15 cm/sec at low speed. If the car travels for 15 seconds at high speed and then 30 seconds at low speed, what distance would the car have traveled?

A. 1050 cm  
B. 1200 cm  
C. 1425 cm  
D. 2475 cm

25. *Algebra I*

The perimeter, \( P \), of a square may be found by using the formula \( \left(\frac{1}{4}\right)P = \sqrt{A} \), where \( A \) is the area of the square. What is the perimeter of the square with an area of 36 square inches?

A. 9 inches  
B. 12 inches  
C. 24 inches  
D. 72 inches

26. *Algebra I*

Assume \( y \) is an integer and solve for \( y \).

\[ |y + 2| = 9 \]

A. \{-11, 7\}  
B. \{-7, 7\}  
C. \{-7, 11\}  
D. \{-11, 11\}

27. *Algebra I*

Which of the following is equivalent to \( 4(x + 5) - 3(x + 2) = 14? \)

A. \( 4x + 20 - 3x - 6 = 14 \)  
B. \( 4x + 5 - 3x + 6 = 14 \)  
C. \( 4x + 5 - 3x + 2 = 14 \)  
D. \( 4x + 20 - 3x - 2 = 14 \)

28. *Algebra I*

Solve for \( x \).

\[ 5(2x - 3) - 6x < 9 \]

A. \( x < -1.5 \)  
B. \( x < 1.5 \)  
C. \( x < 3 \)  
D. \( x < 6 \)

<table>
<thead>
<tr>
<th>Question</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. <em>Algebra I</em></td>
<td>What are the coordinates of the ( x )-intercept of the line ( 3x + 4y = 12? )</td>
</tr>
<tr>
<td>A. (0, 3)</td>
<td>B. (3, 0)</td>
</tr>
</tbody>
</table>

30. *Algebra I*

Which of the following points lies on the line \( 4x + 5y = 20? \)

A. (0, 4)  
B. (0, 5)  
C. (4, 5)  
D. (5, 4)

31. *Algebra I*

Which of the following could be the equation of a line parallel to the line \( y = 4x - 7\)?

A. \( y = \frac{1}{4}x - 7 \)  
B. \( y = 4x + 3 \)  
C. \( y = -4x + 3 \)  
D. \( y = -\frac{1}{4}x - 7 \)

32. *Algebra I*

\[ \begin{align*} 7x + 3y &= -8 \\ -4x - y &= 6 \end{align*} \]

What is the solution to the system of equations shown above?

A. \((-2, -2)\)  
B. \((-2, 2)\)  
C. \((2, -2)\)  
D. \((2, 2)\)

33. *Algebra I*

Simplify.

\[ (x^2 - 3x + 1) - (x^2 + 2x + 7) \]

A. \( x - 6 \)  
B. \(-x + 8 \)  
C. \(-5x - 6 \)  
D. \( 2x^2 - x + 8 \)
34. Algebra 1
A boy is two meters tall. About how tall is the boy in feet (ft) and inches (in.)?
(1 meter ≈ 39 inches)
A. 5 ft 0 in
B. 5 ft 6 in
C. 6 ft 0 in
D. 6 ft 6 in

35. Measurement & Geometry, Grade 7
The actual width (w) of a rectangle is 18 centimeters (cm). Use the scale drawing of the rectangle to find the actual length (l).

A. 6 cm
B. 24 cm
C. 36 cm
D. 54 cm

36. Measurement & Geometry, Grade 7
Marcus can type about 42 words per minute. If he types at this rate for 30 minutes without stopping, about how many words will he type?
A. 1260
B. 2100
C. 2520
D. 4200

37. Measurement & Geometry, Grade 7
In the figure above, the radius of the inscribed circle is 6 inches (in.). What is the perimeter of square ABCD?
A. 12π in.
B. 36π in.
C. 24 in.
D. 48 in.

38. Measurement & Geometry, Grade 7
What is the area of the triangle shown above?
A. 44 square units
B. 60 square units
C. 88 square units
D. 120 square units

39. Measurement & Geometry, Grade 7
One-inch cubes are stacked as shown in the drawing below.

What is the total surface area?
A. 19 in.²
B. 29 in.²
C. 32 in.²
D. 38 in.²
40. **Measurement & Geometry, Grade 7**

A right triangle is removed from a rectangle as shown in the figure below. Find the area of the remaining part of the rectangle.

![Triangle Diagram]

A. 40 in.²  
B. 44 in.²  
C. 48 in.²  
D. 52 in.²

41. **Measurement & Geometry, Grade 7**

The short stairway shown below is made of solid concrete. The height and width of each step is 10 inches (in.). The length is 20 inches.

![Stairway Diagram]

What is the volume, in cubic inches, of the concrete used to create this stairway?

A. 3000  
B. 4000  
C. 6000  
D. 8000

42. **Measurement & Geometry, Grade 7**

A rectangular field is 363 feet long and 240 feet wide. How many acres is the field? (1 acre = 43,560 square feet)

A. 2  
B. 3  
C. 4  
D. 5

43. **Measurement & Geometry, Grade 7**

The points (1, 1), (2, 3), (4, 3), and (5, 1) are the vertices of a polygon. What type of polygon is formed by these points?

A. Triangle  
B. Trapezoid  
C. Parallelogram  
D. Pentagon

44. **Measurement & Geometry, Grade 7**

The club members hiked 3 kilometers north and 4 kilometers east, but then went directly home as shown by the dotted line. How far did they travel to get home?

A. 4 km  
B. 5 km  
C. 6 km  
D. 7 km

45. **Mathematical Reasoning, Grade 7**

A flower shop delivery van traveled these distances during one week: 104.4, 117.8, 92.3, 168.7, and 225.6 miles. How many gallons of gas were used by the delivery van during this week?

What other information is needed in order to solve this problem?

A. The average speed traveled in miles per hour.  
B. The cost of gasoline per gallon  
C. The average number of miles per gallon for the van  
D. The number of different deliveries the van made.
46. **Mathematical Reasoning, Grade 7**

If \(a\) is a positive number and \(b\) is a negative number, which expression is always positive?

A. \(a - b\)  
B. \(a + b\)  
C. \(a \times b\)  
D. \(a + b\)

47. **Mathematical Reasoning, Grade 7**

Which is the best estimate of \(326 \times 279\)?

A. 900  
B. 9,000  
C. 90,000  
D. 900,000

48. **Mathematical Reasoning, Grade 7**

The temperature on a mountain peak was 7 degrees Fahrenheit (°F) at 6:00 p.m. By 8:00 p.m., the temperature had dropped to 0°F. If the temperature continued to drop at about the same rate, which is the best estimate of the temperature at 11:00 p.m.?

A. -20°F  
B. -14°F  
C. -10°F  
D. -9°F

49. **Mathematical Reasoning, Grade 7**

The winning number in a contest was less than 50. It was a multiple of 3, 5, and 6. What was the number?

A. 14  
B. 15  
C. 30  
D. Cannot be determined

50. **Mathematical Reasoning, Grade 7**

Lia used the following process to find the slope of the line described by the equation \(3y + 5x = 12\).

- **Step 1:** Subtract 5\(x\) from each side.
- **Step 2:** Divide each side by 3.
- **Step 3:** The slope of \(y = mx + b\) is \(m\)

According to Lia’s method, which expression gives the slope of the line described by the equation \(ax + by = c\)?

A. \(-\frac{a}{b}\)  
B. \(\frac{a}{b}\)  
C. \(\frac{b}{a}\)  
D. \(\frac{b}{a}\)