Directions:

On the following pages are questions for the Grade 8 Practice Test, a practice opportunity for the Nebraska State Accountability–Mathematics (NeSA–M).

Multiple choice questions will ask you to select an answer from among four choices. For some questions, there may be two parts, Part A and Part B, where each part has a multiple choice question that will ask you to select an answer from among four choices. Multiple select questions will ask you to select multiple correct answers from among five or six answer choices. These types of questions may be found in your test booklet.

For all questions:

- Read each question carefully and choose the best answer.
- You may use scratch paper to solve the problems.
- The Mathematics Reference Sheet is provided in the back of the test booklet. You may refer to this page any time during the test.
- You may use a calculator ONLY for questions 1 - 7. You may NOT use a calculator for any other questions on this test.
- Be sure to answer ALL the questions.

For multiple choice questions, only one of the answers provided is the correct response. For multiple select questions, more than one of the answers provided may be a correct response.

When you come to the word STOP at the end of the section, you have finished the calculator section of the test. You may review only the calculator section to check you answers. At this time, your calculator must be collected.
1. Use the diagram below to answer the question.

What is the value of $x$ in the triangle?

A. 60  
B. 75  
C. 105  
D. 120

2. What is the value of $x$ in $2x - 2 \frac{1}{3} = \frac{2}{3} - 3x$?

A. $x = -\frac{1}{3}$  
B. $x = \frac{3}{5}$  
C. $x = -3$  
D. $x = 15$
3. Use the points on the coordinate plane below to answer the question.

What is the distance between points F and J?

A. 5  
B. 13  
C. 17  
D. 30
4. Which represents the solution to $3x + 2 < -4$?

A. $x < -2$

B. $x > -2$

C. $x < -\frac{2}{3}$

D. $x > -\frac{2}{3}$

5. Use the figure below to answer the question.

Lines $a$ and $b$ are parallel. Which two angles are congruent?

A. $\angle 1$ and $\angle 3$

B. $\angle 1$ and $\angle 4$

C. $\angle 3$ and $\angle 8$

D. $\angle 5$ and $\angle 7$
6. Use the diagram of the grain silo below to answer the question.

What is the maximum amount of grain, in cubic feet, the silo can hold?

A. $246\pi$ ft$^3$
B. $492\pi$ ft$^3$
C. $2,214\pi$ ft$^3$
D. $8,856\pi$ ft$^3$
7. Use the figure below to answer the question.

Using the Pythagorean theorem, what is the value of $x$?

A. 1 inch
B. 7 inches
C. 41 inches
D. 49 inches
THIS IS THE END OF THE CALCULATOR SECTION OF THE TEST

You may NOT use a calculator for any other questions on this test.

Raise your hand and notify your Examiner or Proctor that you are ready to turn in your calculator.

Once your Examiner has collected your calculator and given you permission, you may go on to the non-calculator section of the test.
8. What is the value of $|3| - |-19|$?
   A. $-22$
   B. $-16$
   C. $16$
   D. $22$

9. What is the square root of 100?
   A. $5$
   B. $10$
   C. $25$
   D. $50$
10. Use the table below to answer the question.

<table>
<thead>
<tr>
<th>Oranges and Grapefruit Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oranges</td>
</tr>
<tr>
<td>Grapefruit</td>
</tr>
</tbody>
</table>

The table shows the numbers of oranges and grapefruits sold to six different customers. Which scatter plot represents the data?

A.  
B.  
C.  
D.
11. Jenny has $1.65 in quarters and dimes. She has $x$ quarters and 3 times as many dimes as quarters. Which equation represents this situation?

A. $0.10(x) + 0.25(x) = 1.65$
B. $0.10(x) + 0.25(3x) = 1.65$
C. $0.10(3x) + 0.25(x) = 1.65$
D. $0.10(3x) + 0.25(3x) = 1.65$

12. Use the arrow on the coordinate plane below to answer the question.

The arrow is rotated 90° clockwise about the origin. Which statement correctly describes the quadrant and orientation of the arrow?

A. The arrow is in quadrant II pointing right.
B. The arrow is in quadrant II pointing down.
C. The arrow is in quadrant IV pointing right.
D. The arrow is in quadrant IV pointing down.
13. What is $2.15 \times 10^{-4}$ in standard form?

A. –21,500
B. –0.000215
C. 0.000215
D. 21,500

14. Use the graph below to answer the question.

The graph shows the amount of food Zander’s pet mouse eats compared to his pet bird. Which statement correctly compares the amount of food each pet eats?

A. For every 1 ounce of food the bird eats, the mouse eats 2 ounces of food.
B. For every 2 ounces of food the bird eats, the mouse eats 1 ounce of food.
C. For every 2 ounces of food the bird eats, the mouse eats 3 ounces of food.
D. For every 3 ounces of food the bird eats, the mouse eats 2 ounces of food.
15. Aaron sells jackets online. He adds $4.75 per jacket onto every purchase for shipping. He collected a total of $188.75 selling 5 jackets. Which equation could be used to calculate the sale price, $j$, of each jacket?

A. $5(j + 4.75) = 188.75$
B. $5j + 4.75 = 188.75$
C. $5(4.75) + j = 188.75$
D. $(5 + 4.75)j = 188.75$

16. Which expression represents $m$ squared times 2.56?

A. $2.56 \cdot m \cdot 2$
B. $2.56m^2$
C. $(2.56m)^2$
D. $2(2.56m)$
17. Use the triangles below to answer the question.

Triangles ABC and DEF are similar but not congruent. Which set of transformations could be used to transform triangle ABC onto triangle DEF?

A. A translation 3 units up followed by a rotation 90° counterclockwise about its center.
B. A reflection across the x-axis followed by a dilation of scale factor 2 about the origin.
C. A reflection across the line $y = x$ followed by a rotation 90° clockwise about the origin.
D. A rotation 90° counterclockwise about the origin followed by a dilation of scale factor 0.5 about the origin.

18. Which type of number is $-2$?

A. integer
B. irrational
C. natural
D. whole
19. Use the equation below to answer the question.

\[ 5(2m + 10) = 2(5m + 10) \]

Which statement correctly describes the value of \( m \)?

A. The variable \( m \) has no correct solutions.
B. The variable \( m \) has infinitely many correct solutions.
C. The variable \( m \) has one solution, and it is when \( m = 0 \).
D. The variable \( m \) has one solution, and it is when \( m = 1 \).

20. Students are rafting on a river. They travel approximately 4.7 miles per day. They raft for three days. What is the BEST estimate of the total distance, in miles, they travel?

A. 12
B. 15
C. 19
D. 25
21. Use the scatter plot below to answer the question.

The scatter plot shows the number of minutes played and points scored by some players on a team. Using the line of best fit, which number is CLOSEST to the number of points that would be scored by a player that plays for 27 minutes?

A. 6  
B. 11  
C. 15  
D. 16

22. What is $\frac{\sqrt{3}}{6}$ in simplest form?

A. $\frac{1}{387,420,489}$ 
B. $\frac{1}{19,683}$ 
C. $\frac{1}{27}$ 
D. $\frac{1}{9}$
23. This question has two parts. Answer part A, and then answer part B.

**Part A**

What is the value of the square root of 64?

A. 4  
B. 8  
C. 16  
D. 32

**Part B**

What is the value of the cubed root of 64?

A. 4  
B. 8  
C. 16  
D. 32
24. This question has two parts. Answer part A, and then answer part B.

Dan has 5 coins in his pocket. Each coin is either a nickel or a quarter. The total value of the coins in Dan’s pocket is 65 cents.

**Part A**

Which equation can be used to find the number of quarters, \( q \), in Dan’s pocket?

A. \( 0.05q + 0.25(5 + q) = 0.65 \)

B. \( 0.05(5 + q) + 0.25q = 0.65 \)

C. \( 0.05q + 0.25(5 - q) = 0.65 \)

D. \( 0.05(5 - q) + 0.25q = 0.65 \)

**Part B**

What is the number of quarters, \( q \), in Dan’s pocket?

A. 1

B. 2

C. 3

D. 4
25. This question has two parts. Answer part A, and then answer part B.

   Use the figure below to answer the question.

   ![Diagram](image)

   Line $m$ is parallel to line $n$.

   **Part A**

   Which relationship describes angles $c$ and $g$?

   A. alternate exterior angles  
   B. alternate interior angles  
   C. corresponding angles  
   D. vertical angles

   **Part B**

   Which relationship describes angles $a$ and $h$?

   A. alternate exterior angles  
   B. alternate interior angles  
   C. corresponding angles  
   D. vertical angles
### Pythagorean Theorem

\[ c^2 = a^2 + b^2 \]

### Shape Area

<table>
<thead>
<tr>
<th>Shape</th>
<th>Area</th>
<th>Circumference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle</td>
<td>( A = \pi r^2 )</td>
<td>( C = \pi d = 2\pi r )</td>
</tr>
<tr>
<td>Triangle</td>
<td>( A = \frac{1}{2}bh )</td>
<td></td>
</tr>
<tr>
<td>Rectangle</td>
<td>( A = lw )</td>
<td>( P = 2l + 2w = 2(l + w) )</td>
</tr>
<tr>
<td>Trapezoid</td>
<td>( A = \frac{1}{2}h(b_1 + b_2) )</td>
<td></td>
</tr>
<tr>
<td>Parallelogram</td>
<td>( A = bh )</td>
<td></td>
</tr>
<tr>
<td>Square</td>
<td>( A = s^2 )</td>
<td></td>
</tr>
</tbody>
</table>

### Key

- \( b \) = base
- \( l \) = length
- \( h \) = height
- \( w \) = width
- \( B \) = area of base
- \( s \) = side length
- \( d \) = diameter
- \( r \) = radius

Use 3.14 for \( \pi \)

### 3 - Dimensional Shape Volume

<table>
<thead>
<tr>
<th>3 - Dimensional Shape</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular Prism</td>
<td>( V = lwh = Bh )</td>
</tr>
<tr>
<td>Triangular Prism</td>
<td>( V = \frac{1}{2}lwh = Bh )</td>
</tr>
<tr>
<td>Cone</td>
<td>( V = \frac{1}{3}\pi r^2h )</td>
</tr>
<tr>
<td>Cylinder</td>
<td>( V = \pi r^2h )</td>
</tr>
<tr>
<td>Sphere</td>
<td>( V = \frac{4}{3}\pi r^3 )</td>
</tr>
</tbody>
</table>

### Conversions – Length

<table>
<thead>
<tr>
<th>Standard Units</th>
<th>Metric Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 yard (yd) = 3 feet (ft) = 36 inches (in.)</td>
<td>1 meter (m) = 100 centimeters (cm)</td>
</tr>
<tr>
<td>1 mile (mi) = 1,760 yards (yd) = 5,280 feet (ft)</td>
<td>1 meter (m) = 1,000 millimeters (mm)</td>
</tr>
<tr>
<td></td>
<td>1 kilometer (km) = 1,000 meters (m)</td>
</tr>
</tbody>
</table>

### Conversions – Volume

<table>
<thead>
<tr>
<th>Standard Units</th>
<th>Metric Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup = 8 fluid ounces (fl oz)</td>
<td>1 liter (l) = 1,000 milliliters (ml)</td>
</tr>
<tr>
<td>1 pint (pt) = 2 cups</td>
<td>1 liter (l) = 1,000 cubic centimeters (cu. cm)</td>
</tr>
<tr>
<td>1 quart (qt) = 2 pints (pt)</td>
<td></td>
</tr>
<tr>
<td>1 gallon (gal.) = 4 quarts (qt)</td>
<td></td>
</tr>
</tbody>
</table>

### Conversions – Weight/Mass

<table>
<thead>
<tr>
<th>Standard Units</th>
<th>Metric Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pound (lb) = 16 ounces (oz)</td>
<td>1 gram (g) = 1,000 milligrams (mg)</td>
</tr>
<tr>
<td>1 ton = 2,000 pounds (lb)</td>
<td>1 kilogram (kg) = 1,000 grams (g)</td>
</tr>
<tr>
<td>Sequence</td>
<td>Key</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>C</td>
</tr>
<tr>
<td>7</td>
<td>B</td>
</tr>
<tr>
<td>8</td>
<td>B</td>
</tr>
<tr>
<td>9</td>
<td>B</td>
</tr>
<tr>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>11</td>
<td>C</td>
</tr>
<tr>
<td>12</td>
<td>D</td>
</tr>
<tr>
<td>13</td>
<td>C</td>
</tr>
<tr>
<td>14</td>
<td>D</td>
</tr>
<tr>
<td>15</td>
<td>A</td>
</tr>
<tr>
<td>16</td>
<td>B</td>
</tr>
<tr>
<td>17</td>
<td>B</td>
</tr>
<tr>
<td>18</td>
<td>A</td>
</tr>
<tr>
<td>19</td>
<td>A</td>
</tr>
<tr>
<td>20</td>
<td>B</td>
</tr>
<tr>
<td>21</td>
<td>B</td>
</tr>
<tr>
<td>22</td>
<td>D</td>
</tr>
<tr>
<td>23</td>
<td>Part A: B</td>
</tr>
<tr>
<td></td>
<td>Part B: A</td>
</tr>
<tr>
<td>24</td>
<td>Part A: D</td>
</tr>
<tr>
<td></td>
<td>Part B: B</td>
</tr>
<tr>
<td>25</td>
<td>Part A: C</td>
</tr>
<tr>
<td></td>
<td>Part B: A</td>
</tr>
</tbody>
</table>