FRANKLIN MATH BOWL

7th Grade Written Test 2005

1. Simplify \(10.5 + \frac{4.5}{0.009}\)
   a) \(1666\frac{2}{3}\)  b) 15.5  c) 510.5  d) 60.5

2. Simplify \(\frac{7\frac{12}{35} + 8\frac{5}{7}}{7}\)
   a) \(15\frac{22}{35}\)  b) \(16\frac{2}{35}\)  c) \(15\frac{11}{35}\)  d) \(16\frac{22}{49}\)

3. Consider the pattern: xo
   xxo
   xxxxo
   xxxxo........

   If the pattern continues, what would be the 30th and 31st characters?
   a) xo  b) ox  c) xx  d) oo

4. A circle has a diameter of 6 cm. A central angle intersects an arc of 60 degrees on the circumference. Approximately how long is the arc in centimeters?
   a) 3.14 cm  b) 6 cm  c) 6.28 cm  d) 12.04 cm

5. The number \(3\pi\) is closest to which of the following?
   a) \(\sqrt{85}\)  b) \(\frac{47}{5}\)  c) 9.5  d) 10

6. Which of the following can NOT be the length of the third side of a triangle with two sides measuring 5 inches and 7 inches?
   a) 5 inches  b) 13 inches  c) 3 inches  d) 11 inches
7. A jar contains 60 marbles, 8 of which are blue. The probability of picking a red OR blue marble from the jar is 1/3. How many red marbles are there in the jar?
   a) 8       b) 20       c) 15       d) 12

8. What is the area of a right triangle with sides measuring 5 m, 12 m, and 13 m?
   a) $78 \ m^2$       b) $32 \frac{1}{2} \ m^2$       c) $60 \ m^2$       d) $30 \ m^2$

9. Sue is making a quilt design and wants to use two regular polygons that tessellate. She chooses a triangle for one of the polygons. Which of the following polygons can she choose for the second?
   a) circle       b) octagon       c) pentagon       d) hexagon

10. On a five hour car trip, Joe traveled at an average speed of 40 mph for 2 hours and then at an average speed of 60 mph for 3 hours. What was the average speed for the five hour trip?
    a) 50 mph       b) 52 mph       c) 55 mph       d) 48 mph

11. Al’s home is 4 km due south of his school. His home is 6 km due west of Citizen’s Bank. The bus station is 9 km due east of the school. How far is the bus station from the bank?
    a) 19 km       b) 5 km       c) 7 km       d) 6 km

12. The Johnson City Girls’ Club had 260 members in 2002. The membership increased 25% from 1997 to 2002. How many members did the Club have in 1997?
    a) 195       b) 200       c) 220       d) 208
13. How many diagonals does a regular octagon have?
   a) 8    b) 14    c) 32    d) 20

14. What is the number of degrees in an exterior angle of a regular hexagon?
   a) 60 degrees    b) 120 degrees    c) 80 degrees    d) 40 degrees

15. A store has tables for sale at $240. On October 1st, they reduce the price by 10%. On November 1st, they reduce the price by an additional 8%. Then on December 1st, in preparation for the Christmas season, they reduce the price by an additional 12%. What is the selling price after the third reduction?
   a) $168.00    b) $170.25    c) $180.27    d) $174.87

16. The average of the complement and the supplement of angle A measures 95 degrees. What is the measure of angle A?
   a) 80 degrees    b) 30 degrees    c) 40 degrees    d) 50 degrees

17. Jill is planning to serve chocolate pudding at her party. She wants to give each guest 2/3 cup of pudding and the recipe makes 8 cups. How many servings will she have if she doubles the recipe?
   a) 10 2/3    b) 12    c) 16    d) 24

18. Paul bought some grass seed and gave 1/3 of the bag to his neighbor. He then used 15 pounds on his lawn and found that he had 25 pounds left. How many pounds were in the bag at the beginning?
   a) 40 pounds    b) 60 pounds    c) 120 pounds    d) 80 pounds

19. Alice receives a salary of $650.00 per week. She also gets a $50 bonus for each car she sells, but must pay $15 for parking each week. How much did she make in a week when she sold 4 cars?
   a) $685    b) $850    c) $735    d) $835
20. What is the mean of the largest and smallest of the following measurements:

<table>
<thead>
<tr>
<th>.002 km</th>
<th>2.2 cm</th>
<th>222.2 mm</th>
<th>.22 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 1.011 m</td>
<td>b) 1.0111 m</td>
<td>c) 1.11 m</td>
<td>d) 11.101 m</td>
</tr>
</tbody>
</table>

21. John is 4 ½ feet tall. His shadow at 5 pm is 3 feet long. If the shadow of a tree in his yard at the same time is 20 feet long, how tall is the tree?

| a) 13 1/3 feet | b) 30 feet | c) 49.5 feet | d) 18 feet |

22. Solve for A and B:

\[
\begin{bmatrix}
2(A - 2) & 0 \\
0 & \frac{5B + 1}{2}
\end{bmatrix}
= \begin{bmatrix}
6A + 8 & 0 \\
0 & 3B
\end{bmatrix}
\]


23. Los Angeles is on Pacific Time, which is three hours behind Eastern Time. A plan leaves New York at 8 a.m., has a two-hour layover in Cleveland, and arrives in Los Angeles at 1:45 p.m. What was the actual flying time?

| a) 3 hrs, 45 min | b) 6 hrs, 45 min | c) 5 hrs, 45 min | d) 4 hrs, 45 min |

24. Bob has 4 cylindrical tubs full of homemade ice cream, each with a diameter \(d = 6 \text{ in}\) and a height \(h = 6 \text{ in}\). He wants to consolidate the four tubs into one. Which of the following could be the dimensions of a cylindrical tub which holds four times as much as one of the smaller tubs?

| a) \(d = 6 \text{ in}, h = 12 \text{ in}\) | b) \(d = 9 \text{ in}, h = 9 \text{ in}\) | c) \(d = 12 \text{ in}, h = 6 \text{ in}\) | d) \(d = 12 \text{ in}, h = 12 \text{ in}\) |

25. Five numbers have a mean of 64 and a median of 60. If the sum of the largest two numbers is 150 and the mode is less than the median, what is the mode of the five numbers?

| a) 50 | b) 52 | c) 55 | d) can’t be determined |