AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE 37040

Junior High School Mathematics Competition

SEVENTH GRADE TEST
1976
SCORING FORMULA: 4R-W

Prepared by:
The Mathematics Department

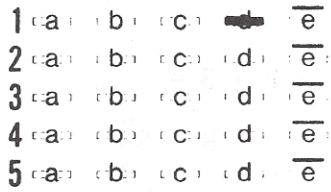
DIRECTIONS:

This is a test of your competence in Junior High School Mathematics. For each problem there are 5 possible answers listed. You are to work the problems, determine the correct answer, and indicate your choice on the separate answer sheet provided you.

SAMPLE:

1. If X + 1 = 2, then X equals:

   A. 0
   B. 2
   C. -1
   D. 1
   E. None of the above



The correct answer is 1, which is answer (D) so you would answer this problem by darkening the space on the answer sheet corresponding with this choice.

If you should change your mind about an answer, be sure to erase completely. Avoid wild guessing as wrong answers count against you. Do not mark more than one answer for any problem. Make no stray marks of any kind on your answer sheet.

When told to do so, open your test booklet to page 2 and begin. When you have finished one page, go on to the next. The working time for the entire test is 80 minutes.

1. $\frac{27}{6} =$

A. $2\frac{7}{6}$ B. $3\frac{7}{6}$ C. $4\frac{3}{2}$ D. $4\frac{1}{2}$ E. 4.3

2. $\frac{5}{6} \div \frac{2}{5} =$

A. $\frac{6}{5} \times \frac{5}{2}$ B. $\frac{5}{6} \div \frac{5}{2}$ C. $\frac{6}{5} \times \frac{2}{5}$ D. $\frac{5}{6} \times \frac{5}{2}$ E. $\frac{2}{5} \div \frac{6}{5}$

3. Find the set of common factors of 12, 20 and 36.

A. {1, 2, 3, 4, 6, 12}
B. {1, 2, 4}
C. {6, 10, 18}
D. {3, 5, 9}
E. None of the above

4. The greatest common divisor of 24 and 144 is

A. 6 B. 12 C. 24 D. 72 E. 144

5. The first five prime numbers are

A. 2, 4, 6, 8, 10
B. 1, 3, 5, 7, 9
C. 1, 2, 3, 4, 5
D. 2, 3, 5, 7, 11
E. 0, 1, 2, 3, 4

6. Which of the following can <u>not</u> be represented as a product of two natural numbers, each of which is less than ten?

A. 12 B. 18 C. 27 D. 39 E. 45

7. $8 + 4 \div 6 \times 2 - 3 =$

A. 1 B. $5\frac{2}{3}$ C. $6\frac{1}{3}$ D. 4 E. 7

8. $\frac{2^5 \cdot 5^2 \cdot 3^2 \cdot 5^7}{3 \cdot 2^4 \cdot 5^9} =$

A. 18 B. 6 C. 12 D. 0 E. None of these

9. Find the solution set for $\frac{2}{3} + n = \frac{1}{4} + \frac{1}{2}$.

A. $\{\frac{1}{12}\}$ B. $\{\frac{1}{6}\}$ C. $\{\frac{1}{2}\}$ D. $\{\frac{2}{3}\}$ E. $\{\frac{17}{12}\}$

10. Find the solution set for $\frac{21}{49} = \frac{15}{x}$.

A. {25} B. {30} C. {35} D. {36} E. {42}

11. Find the solution set for $\frac{4}{3} \div x = \frac{5}{3}$.

A. $\left\{\frac{5}{4}\right\}$ B. $\left\{\frac{5}{3}\right\}$ C. $\left\{\frac{3}{5}\right\}$ D. $\left\{\frac{4}{3}\right\}$ E. $\left\{\frac{4}{5}\right\}$

12. Which of the following is expressed in scientific notation?

A. 125×10^6
B. 6.1×10^5
C. 75×10^2
D. 0.13×10^4
E. 16.2×10^{-4}

13. The mean of the numbers 65, 75, 78, 74, 62 and x is 70. Find the number x.

A. 70 B. 68 C. 66 D. 72 E. None of these

14. 342_{five} =

A. 342 B. 145 C. 87 D. 97 E. 2332

15. Let n(A) denote the number of members in the set A. If A and B are sets such that $n(A) = 8$, $n(B) = 6$ and $n(A \cup B) = 12$, then $n(A \cap B)$ =

A. 1 B. 8 C. 2 D. 12 E. 6

16. 12^0 =

A. 0 B. 1 C. 12 D. 120 E. $\frac{1}{12}$

17. The statement $7(4 \cdot 9) = (4 \cdot 9)7$ is an instance of what property?

A. The Associative Property of Multiplication
B. The Associative Property of Addition
C. The Commutative Property of Multiplication
D. The Commutative Property of Addition
E. The Distributive Property

18. The operation * is defined as follows:

$x * y = x^y$

then $8 * 2$ is

A. 4 B. 16 C. 64 D. 256 E. $\frac{1}{4}$

19. A luncheon special on a menu includes a choice of 4 salads, 3 beverages, and 2 desserts. In how many different ways can someone choose a salad, beverage, and dessert?

A. 9 B. 24 C. 3 D. 1 E. 14

20. A bag of marbles contains three red marbles, three white marbles and four blue marbles. If a single marble is drawn at random from the bag what is the probability that the marble drawn is blue?

A. $\frac{4}{10}$ B. $\frac{3}{10}$ C. $\frac{4}{7}$ D. $\frac{3}{7}$ E. $\frac{4}{3}$

21. A fair coin is tossed 3 times. What is the probability that, of the 3 tosses, two are heads and one is a tail?

A. $\frac{2}{3}$ B. $\frac{3}{8}$ C. $\frac{1}{2}$ D. $\frac{3}{4}$ E. $\frac{1}{3}$

22. How many acute angles does an acute triangle have?

A. 0 B. 1 C. 2 D. 3 E. None of these

23. In any triangle, the sum of the measures of the angles in degrees is

A. 60 B. 120 C. 180 D. 360 E. 90

24. A rectangle $3\frac{3}{8}$ in. long has a perimeter of $9\frac{1}{12}$ in. How wide is it?

A. $1\frac{1}{6}$ in. B. $2\frac{1}{3}$ in. C. $6\frac{3}{4}$ in. D. $4\frac{14}{24}$ in. E. $1\frac{11}{16}$ in.

25. Which is the best approximation of the measure of the angle pictured below?

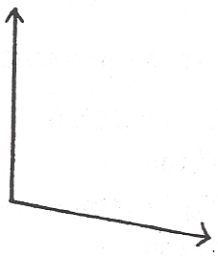
A. 10^{o}

B. 20^{o}

C. 60^{o}

D. 80^{o}

E. 100^{o}



26. Suppose $\triangle ABC$ is a right triangle where $\angle C$ is a right angle, $AB = 10$ and $BC = 6$. Then $AC =$

A. 10 B. 6 C. 8 D. 12 E. $\sqrt{136}$

27. Which of the following is <u>not</u> a polygon?

A. a triangle
B. a square
C. a quadrilateral
D. a pentagon
E. a circle

28. Which of the following indicates the measure of greatest length?

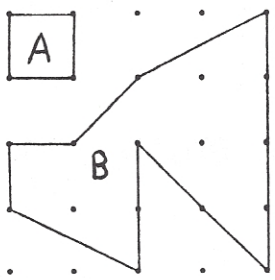
A. .012 m B. 85 mm C. 13 cm D. 6.29 dm E. 0.00000101 km

29. Identify the false statement.

A. A mile is shorter than 2 kilometers.
B. A quart of liquid is less than a liter of the same liquid.
C. Steak costing $1.50 per pound costs less than $3 per kilogram.
D. A six in. long pencil is more than 12 centimeters long.
E. The temperature on a very warm summer day would most likely be no higher than 40 Celsius.

30. If the square region labeled A is assigned an area 1 sq. unit, find the area of the region labeled B.

A. $7\frac{1}{2}$
B. 8
C. $8\frac{1}{2}$
D. 9
E. 12



31. Jack's shadow is four-fifths as long as that of his father. If Jack is 4 feet 8 inches tall, how tall is his father?

A. 5 feet 10 inches
B. 6 feet 2 inches
C. 5 feet 8 inches
D. 5 feet 4 inches
E. 6 feet 4 inches

32. A living-room floor measures 13 feet by 24 feet. A 12 feet by 18 feet rug is placed on the floor. How many square feet of floor are <u>not</u> covered by the rug?

A. 216 B. 96 C. 312 D. 528 E. None of these

33. The Johnsons saved $1,050 during 1975. This was 7% of the family income. The family income was

A. $10,500 B. $7,350 C. $15,000 D. $8400 E. None of these

34. Montgomery Ward is advertising a sale on coats for $40 each. If this represents a discount of 20% off the original price, what was the amount of the discount?

A. $40 B. $50 C. $10 D. $8 E. $32

35. David has 2 hits in 6 times at bat so far this baseball season. If he is to maintain his current rate of hitting, how many hits must he get in his next 30 times at bat?

A. 10 B. 15 C. 5 D. 12 E. None of these

36. In a school of 616, there are 6 girls for every 5 boys. How many boys are there?

A. 280 B. 336 C. 56 D. 140 E. 168

37. In a class of 40, we find that $\frac{2}{5}$ of the students are boys. Furthermore, $\frac{3}{4}$ of the boys are on the basketball team. How many boys from this class are on the basketball team?

A. 10 B. 8 C. 5 D. 12 E. 15

38. $8{,}461 \cdot 876 + 8{,}461 \cdot 124 =$

A. 923,562 B. 8,461,000 C. 746,183 D. 3,461,852 E. 9,856

39. $1.646464 \cdot \cdot \cdot =$

A. $\frac{164}{100}$ B. $\frac{164}{99}$ C. $\frac{163}{99}$ D. $\frac{163}{100}$ E. None of these

40. A grasshopper is hopping towards a weed which is 4 feet away. On the first hop he goes 2 feet and after that on each hop he only goes half as far as on the previous hop. What is the distance, measured in feet, from the grasshopper to the weed after the 30th hop?

A. $\frac{1}{28}$ B. $\frac{1}{2^{28}}$ C. 0 D. $\frac{1}{2^{30}}$ E. $\frac{1}{30}$