AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE 37040

Junior High School Mathematics Competition

SEVENTH GRADE TEST
1977
SCORING FORMULA: 4R-W

Prepared by:
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Austin Peay State University
and
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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

1 a b c ■ e
2 a b c d e
3 a b c d e
4 a b c d e
5 a b c d e

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. The product of -3 and -12 is

   a. 36 b. -36 c. 15 d. -15 e. 4

2. .78584 ÷ .94 =

   a. 83.6 b. 836 c. 8.36 d. .0836 e. .836

3. .0036 is the same as

   a. 3.6% b. .036% c. 36% d. .36% e. 3%

4. Two sides of a triangle have lengths $\frac{5}{3}$ in. and $\frac{7}{4}$ in. The perimeter is 5 inches. What is the length of the third side.

   a. $\frac{19}{12}$ in. b. 4 in. c. $\frac{23}{7}$ in. d. $\frac{5}{3}$ in. e. $\frac{3}{2}$ in.

5. 240% of 72 is

   a. 30 b. 300 c. 172.8 d. 1728 e. 17.28

6. Find the Fahrenheit reading corresponding to a Celsius reading of 35^{o}.

   a. 135^{o} b. 31^{o} c. 95^{o} d. 67^{o} e. none of the above

7. The approximate distance light travels in one year is 31,000,000,000,000,000 miles. Write this number in scientific notation.

   a. 31×10^{15} c. 3.1×10^{5} e. 3.1×10^{16}

   b. 31×10^{5} d. $.31 \times 10^{-17}$

8. A store sells two types of balloons. One type sells at the rate of 3 for 5¢ while the other sells at the rate of 2 for 5¢. The total cost for 12 balloons of each type is

   a. 40¢ b. 50¢ c. 90¢ d. 60¢ e. 30¢

9. Which of the following is always true, given that the replacement set of the variable is the set of whole numbers?

   a. $\frac{a}{0} = 0$ b. $0 \div 0 = 0$ c. $\frac{a}{a} = 1$ d. All of the above are true

   e. None of the above are true.

10. $5x^3$ means

a. $5 \cdot x \cdot x \cdot x$ c. $5 + x + x + x$ e. none of these

b. $5 \cdot 5 \cdot 5 \cdot x \cdot x \cdot x$ d. $15 \cdot x \cdot x \cdot x$

11. Which of the following numeral expressions, when completely simplified, will produce 20?

a. $40 - 2 + 6 \cdot 5 \div 2$ c. $40 - (2 + 6) \cdot 5 \div 2$ e. none of these

b. $(40 - 2) + 6 \cdot 5 \div 2$ d. $[(40 - 2) + 6] \cdot 5 \div 2$

12. Find the solution set for $\frac{5}{2} + x = \frac{1}{3} + \frac{1}{2}$.

a. $\{3\frac{1}{3}\}$ b. $\{-1\frac{2}{3}\}$ c. $\{-2\frac{1}{3}\}$ d. $\{1\frac{2}{3}\}$ e. $\{2\frac{2}{3}\}$

13. The operation $*$ is defined as follows: $x * y = x + y + xy$.
Then $8 * 7 =$

a. 56 b. 15 c. 64 d. 71 e. 63

14. In a class of 15 girls and 9 boys the ratio of the number of girls to the number of students in the class is

a. $\frac{15}{9}$ b. $\frac{9}{15}$ c. $\frac{5}{8}$ d. $\frac{3}{8}$ e. $\frac{5}{3}$

15. A millisecond is one thousandth of a second. A microsecond is one millionth of a second. The number of microseconds in a millisecond is

a. 100 b. 10 c. 1000 d. 100,000 e. 1,000,000

16. The solution set for $\frac{2 + x}{3 - x} = \frac{8}{5}$ is

a. $\{\frac{34}{13}\}$ b. $\{\frac{14}{13}\}$ c. $\{\frac{14}{3}\}$ d. $\{\frac{34}{3}\}$ e. none of these

17. A rectangle has perimeter 36 and one side of length 10. The area of this rectangular region is

a. 80 square units c. 40 square units e. 260 square units

b. 160 square units d. 130 square units

18. Which of the following numbers is irrational?

a. 3.1416 b. 1.414 c. .6666... d. $-5\frac{1}{2}$ e. none of the above

19. The Jones High School Alumni Association ran a theatre party and sold tickets at $5.25 each. If receipts totaled $551.25, how many tickets were sold?

a. 10 b. 1050 c. 10.5 d. 3417 e. 105

20. Joe walked $8\frac{1}{8}$ miles in $2\frac{1}{2}$ hours. What was his average walking speed in miles per hour?

a. $\frac{4}{13}$ b. $10\frac{5}{8}$ c. $5\frac{5}{8}$ d. $3\frac{1}{4}$ e. 3

21. Solve the equation $4\frac{2}{3} \div N = 14$.

a. 3 b. $4\frac{2}{3}$ c. $\frac{1}{3}$ d. $\frac{8}{21}$ e. $18\frac{2}{3}$

22. In a certain class the ratio of girls to boys was 5 to 4. If there are 80 boys in the class, how many students are there in all?

a. 100 b. 200 c. 180 d. 120 e. 160

23. If $A \cap B = B$ then

a. $A \neq B$ b. $A \subseteq B$ c. $B \subseteq A$ d. $A \cup B = B$ e. $A = \emptyset$

24. The number of elements in $\{\emptyset\} \cup \{\ \}$ is

a. $\emptyset$ b. 0 c. 2 d. 1 e. none of these

25. A dress was purchased for $40.00 on a sale where each item was reduced by 25%. How much was saved by buying on the sale?

a. $10 b. $12.50 c. $13.33 d. $7.77 e. none of these

26. Which of the following is an example of the associative law for addition?

a. $3 + 2 = 2 + 3$

b. $5 \times (3 + 4) = (5 \times 3) + (5 \times 4)$

c. $3 + (2 + 4) = (2 + 4) + 3$

d. $5 + (3 + 1) = (5 + 3) + 1$

e. none of the above

27. Two pennies are tossed. What is the probability that both will land heads up?

a. 2 b. $\frac{1}{2}$ c. $\frac{1}{4}$ d. 1 e. 0

28. Which of the following is a measure of volume?

a. decimeter
b. meter
c. cubic centimeter
d. kilometer
e. square decimeter

29. When measuring (to the nearest centimeter) a box with a ruler marked off in centimeters, what is the greatest possible error?

a. 1 millimeter
b. 5 millimeters
c. 1 centimeter
d. 2 centimeters
e. There will be no error.

30. To find the radius of a circle where circumference is 60 inches.

a. Multiply 60 by π
b. Divide 60 by 2π
c. Divide 30 by 2π
d. Divide 60 by π and extract the square root of the result.
e. Multiply 60 by $\frac{\pi}{2}$.

31. If $n + 4 = 12$ in base eight, then n is:

a. 20_8 b. 8_8 c. 3_8 d. 6_8 e. none of these

32. Find <u>all</u> solutions of $x^2 \leq 5$ that are members of $\{-1, 0, 1, 2, 3, 4\}$

a. $\{-1, 0, 1, 2\}$
b. $\{-1, 0, 1, 2, 3\}$
c. $\{0, 1, 2, 3, 4\}$
d. $\{-1, 0, 1, 2, 3, 4\}$
e. $\{1, 2\}$

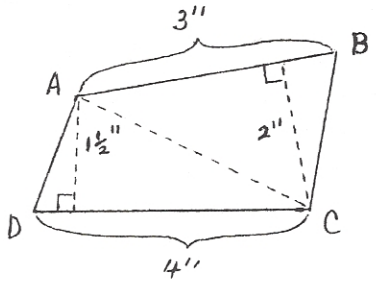
33. The least common multiple of 20, 24, 32 is

a. 960 b. 1920 c. 15,360 d. 240 e. none of these

34. A particular snowfall is such that 7 inches of snow melts down to 1.5 inches of water. A bucket of snow melts and, after melting, the water in the bucket is $3\frac{1}{8}$ inches deep. How deep was the snow in the bucket before melting?

a. $14\frac{7}{12}$ inches
b. 14 inches
c. $15\frac{1}{8}$ inches
d. 16 inches
e. $14\frac{1}{2}$ inches

35. Find the area of region ABCD.



a. 3 square inches

b. 6 square inches

c. 9 square inches

d. 4 square inches

e. none of the above

36. A newspaper boy has sold $\frac{3}{7}$ of his newspapers on a certain day. He has 36 newspapers left. How many papers did he have before he started his day of sales?

a. 84 b. 63 c. 108 d. 144 e. 48

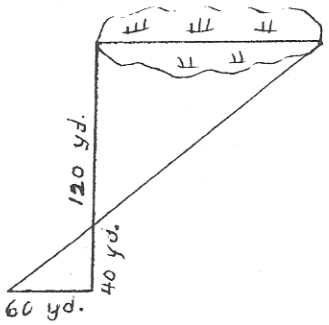
37. If the sum of two numbers is 11 and the smaller is 13 less than twice the larger, then the numbers are

a. 5 and 6 b. 4 and 7 c. 3 and 8 d. 9 and 5 e. none of these

38. Five distinct lines in a plane will intersect in a maximum of:

a. 5 points b. 10 points c. 15 points d. 6 points e. 9 points

39. Using the figure below, find the distance across the swamp.



a. 160 yards

b. 180 yards

c. 240 yards

d. 120 yards

e. none of the above

40. Predict the next three numbers in the following sequence.

1, 1, 2, 3, 5, 8, 13, ___, ___, ___

a. 20, 29, 40 c. 19, 26, 34 e. none of the above

b. 21, 34, 55 d. 20, 27, 36