AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE 37040

Junior High School Mathematics Competition

SEVENTH GRADE TEST
1978
SCORING FORMULA: 4R-W + 40

Prepared by:
The Mathematics Departments of
Austin Peay State University
and
Middle Tennessee State University

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. A man earns a commission of 2% on all sales he makes plus a salary of $800. per month. For the month of December his sales were $6000. What should be his gross pay for December?

(a) $920 (b) $312

(c) $816 (d) $904

(e) none of the above

2. Distinct lines in a plane each perpendicular to the same line:

(a) Share at least two points.

(b) Share at least one point.

(c) Are parallel.

(d) Are perpendicular.

(e) Form a triangle.

3. A meat roast that weighed 6 pounds decreased in weight while cooking to 3.9 pounds. What was the percent of decrease?

(a) 54% (b) 5.4%

(c) 65% (d) 3.5%

(e) 35%

4. If x and 12 are relatively prime, then x could be a multiple of:

(a) 2 (b) 8

(c) 10 (d) 5

(e) 6

5. If $\frac{a}{b} = \frac{c}{d}$, then:

(a) $ac = bd$ (b) $a + b = c + d$

(c) $a - c = b - d$ (d) $ad = bc$

(e) none of the above

6. Evaluate $-3 - 2[-5(1) + 2(3)]$

(a) -1 (b) -5

(c) -25 (d) +19

(e) +5

7. If $15 + a = 13 + b$, then:

(a) $a > b$ (b) $a = b$

(c) $a < b$ (d) $a = 0$

(e) none of the above

8. The repeating decimal $.\overline{444}$ may be written as:

(a) 4/10 (b) 444/1000

(c) 9/4 (d) 44/100

(e) 4/9

9. The base six numeral for 120 (one hundred twenty) is:

(a) 320 (b) 32

(c) 42 (d) 200

(e) none of these

10. In an auditorium there are 3 women for every 2 men. If there are 69 women in the auditorium, how many men are there?

(a) 46 (b) 23

(c) 138 (d) 103.5

(e) 104

11. City A is 50 miles east of City B and City C is 20 miles north of City B. What is the distance from City A to City C?

(a) 70 miles (b) $10\sqrt{29}$ miles

(c) 129 miles (d) $5\sqrt{26}$ miles

(e) none of the above

12. The greatest common factor of 144 and 630 is:

(a) 5040 (b) 90720

(c) 18 (d) 36

(e) 72

13. Given a square of side $S > 0$, if the side is increased by one unit, the area of the resulting square is:

(a) $S^2 + 1$ (b) $S^2 + S$

(c) $S^2 + S + 1$ (d) $S^2 + 2S + 1$

(e) $S^2 + 2S + 2$

14. If five less than four times a number is twenty-three, the number is:

(a) 4 (b) 5

(c) 7 (d) 27/5

(e) 9/2

15. How many of the natural numbers less than 20 are prime?

(a) 5 (b) 6

(c) 7 (d) 8

(e) 9

16. A train can travel 105 miles in 1½ hours. At this rate how far can it travel in 4 hours?

(a) 280 miles (b) 250 miles

(c) 210 miles (d) 287 miles

(e) none of the above

17. If the operation $\oplus$ is defined as follows:
$x \oplus y = (x - y)x + xy$, then $5 \oplus 2 =$

(a) 4 (b) -6

(c) 10 (d) 32

(e) 25

18. In triangle ABC, side AB measures 5 units, side BC measures 12 units, and side AC measures 13 units, Angle B is:

(a) impossible to determine.

(b) an obtuse angle.

(c) a right angle.

(d) an acute angle.

(e) none of the above.

19. If $a = 3$ and $b = -2$ then $\dfrac{ab^3}{(a+b)^2} =$

(a) -18/5 (b) -1/5

(c) -2/3 (d) -18

(e) -24

20. If a ball bounces to a height that is half the distance it drops, to what height will the ball rebound after the sixth bounce if it it is dropped from a height of 120 inches?

(a) 20 inches (b) 1 inch

(c) 7.5 inches (d) 1 7/8 inches

(e) none of the above

21. The Celsius reading corresponding to a Farenheit reading of 86^0 is:

(a) 212^0 (b) 45^0

(c) 32^0 (d) 65^0

(e) none of the above

22. Margaret bought a book at a discount of 10%. The discount amounted to 65 cents. How much did she pay for the book.

(a) \$5.00 (b) \$5.50

(c) \$5.85 (d) \$6.50

(e) \$7.50

23. In 1915, New York City had its record snowstorm for April. 10.1 inches of snow fell at a rate of 0.42 inches per hour. About how long did the snowstorm last?

(a) 4 hours (b) 24 hours

(c) 42 hours (d) 125 hours

(e) 250 hours

24. In the addition problem on the right, the computation was done in base:

(a) eight (b) nine

(c) ten (d) twelve

(e) none of the above

$$\begin{array}{r} 312 \\ 521 \\ +113 \\ \hline 1146 \end{array}$$

25. Class A has 5 students more than Class B. If 4 students from Class A are transferred to Class B, how many more students will be in Class B than in Class A?

(a) 9 (b) 13

(c) 6 (d) 1

(e) 3

26. The ratio of width to height of a rectangle screen in a threatre is 2.5 to 1. How many square feet are contained in the screen if the height of the screen is 24 feet?

(a) 9.6 (b) 60

(c) 34 (d) 230

(e) 1440

27. A drive-in theatre has 20 rows for cars. If 20 cars can be parked in the first row and each of the following rows has 2 more spaces than the preceding row, how many cars would the drive-in hold?

(a) 400 (b) 780

(c) 800 (d) 600

(e) 640

28. Given that $A \subseteq B$, it follows that:

(a) $A \cap B = \emptyset$ (b) $B \subseteq A$

(c) $A \cup B = A$ (d) $A \cap B = A$

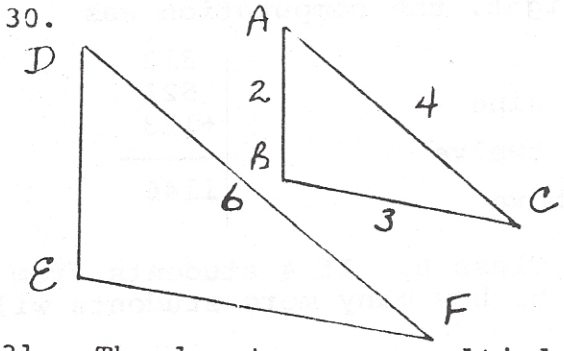
(e) B contains more elements than A

29. A baseball team played 150 games. They won 30 games more than they lost. How many games did they win?

(a) 180 (b) 90

(c) 105 (d) 120

(e) none of the above

30. 

Triangle ABC is similar to triangle DEF. If the lengths of the sides are as indicated, find the length of side EF.

(a) 12 (b) 3

(c) 5 (d) 4½

(e) 4

31. The least common multiple of $a = 2 \cdot 3^2 \cdot 5 \cdot 7^4$ and $b = 2^3 \cdot 3 \cdot 5 \cdot 7^2$ is:

(a) $2^4 \cdot 3^3 \cdot 5^2 \cdot 7^6$ (b) $2 \cdot 3 \cdot 5 \cdot 7^2$

(c) $2^2 \cdot 3 \cdot 7^2$ (d) $2^3 \cdot 3^2 \cdot 5 \cdot 7^4$

(e) $2^3 \cdot 3^2 \cdot 5^2 \cdot 7^4$

32. A carpenter needs to divide a board into 5 pieces of equal length. If the board is 42 3/4 inches long and a width of 1/16 inches is lost by each saw cut, how long will each piece be?

(a) 8.3 inches (b) 8.4 inches

(c) 8.5 inches (d) 8.0 inches

(e) 8.25 inches

33. Triangle ABC is similar to triangle DEF with AC = 6 and DF = 3. If the area of triangle ABC is 36, then the area of triangle DEF is:

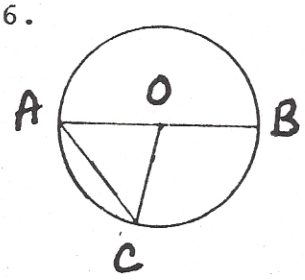
(a) 9 (b) 12
(c) 18 (d) 72
(e) 144

34. The sum of 10^3 and 10^5 is:

(a) 10^8 (b) 10^{15}
(c) 28^8 (d) 101,000
(e) none of the above

35. What is the measure of each angle of a regular pentagon?

(a) 100 degrees (b) 108 degrees
(c) 116 degrees (d) 120 degrees
(e) none of the above

36. 

In the diagram, 0 is the center of the circle and the measure of $\angle BOC = 100^0$. What is the measure of $\angle CAB$?

(a) 80^0 (b) 50^0
(c) 40^0 (d) 60^0
(e) 45^0

37. Simplify: $3 + 2 \times 4 - 8 \div 4$

(a) 3 (b) 3/4
(c) 9 (d) 5
(e) none of the above

38. A quadrilateral in which the diagonals do <u>not</u> bisect each other could be a:

(a) rhombus (b) parallelogram
(c) rectangle that is not a square
(d) square (e) trapezoid

39. In a card game, Tim scored 23 points more than Don. The sum of Tim's score and Don's score was 199. How many points did Don have?

(a) 111 (b) 81

(c) 88 (d) 78

(e) none of the above

40. The equation, $y = \frac{k}{x}$, expresses the fact that y varies inversely as x. If x is 2 when y is 1, what is x when y is 2?

(a) 1 (b) 2

(c) 3 (d) 4

(e) none of the above