AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE 37040

Junior High School Mathematics Competition

SEVENTH GRADE TEST
1980
SCORING FORMULA: 4R - W + 40

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

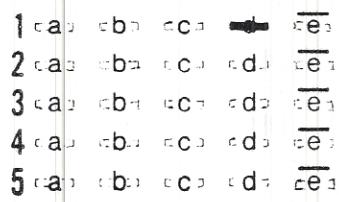
   (a) 0

   (b) 2

   (c) -1

   (d) 1

   (e) none of the above



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 proglem. 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. If $a \times b = 0$ then

   (a) a must be 0

   (b) b must be 0

   (c) both a and b must be 0

   (d) neither a nor b must be 0

   (e) either a or b must be 0

2. $2\frac{3}{4} \div 1\frac{1}{4} =$

   (a) $3\frac{7}{16}$

   (b) $2\frac{1}{5}$

   (c) $2\frac{1}{11}$

   (d) $2\frac{3}{16}$

   (e) 3

3. Five students in a class have grades of 85, 90, 75, 60 and 70 on a test. What is the average score for this sample of students?

   (a) 76

   (b) 75

   (c) 74

   (d) 73

   (e) 380

4. To find what percent 6 is of 24, you write the proportion, $\frac{n}{?} = \frac{6}{24}$.

   (a) 6

   (b) 24

   (c) 144

   (d) 100

   (e) 4

5. If a train travels at a constant speed covering 208 miles in 4 hours, how far will it travel in 7 hours at the same speed?

   (a) 1456 miles

   (b) 364 miles

   (c) 624 miles

   (d) 119 miles

   (e) 400 miles

6. 34.56 dam = _____ mm

   (a) .3456

   (b) .003456

   (c) 3456

   (d) 3,456,000

   (e) 345,600

7. The base angles of an isosceles triangle each have a measure of 40 degrees. The measure of the vertex angle is

   (a) 100 degrees
   (b) 50 degrees
   (c) 140 degrees
   (d) 40 degrees
   (e) none of these

8. Ten dimes are stacked in a pile. The height of the pile is approximately

   (a) 1 dm
   (b) 1 mm
   (c) 1 km
   (d) 1 m
   (e) 1 cm

9. A bank pays 7% interest compounded annually. How much will a deposit of $300 accumulate to in 2 years?

   (a) $342.00
   (b) $343.47
   (c) $321.00
   (d) $314.47
   (e) none of the above

10. The next two terms of the sequence, 2, 3, 6, 11, 18, ... are

    (a) 27 and 28
    (b) 25 and 32
    (c) 27 and 36
    (d) 25 and 30
    (e) none of the above

11. To multiply 10 by $\frac{1}{5}$ is the same as to divide 10 by

    (a) .2
    (b) 2
    (c) 2.5
    (d) 5
    (e) 50

12. The total number of distinct prime divisors of 175 and 693 is

    (a) 4
    (b) 5
    (c) 6
    (d) 7
    (e) more than 7

13. If a whole number has an odd number of divisors, we can be sure that the number is

(a) even
(b) odd
(c) a perfect square
(d) prime
(e) none of the above

14. A ballplayer's ratio of number of hits to number of times at bat is 4 to 14. If the ballplayer has 24 hits, how many times has he been at bat?

(a) 34
(b) 84
(c) 38
(d) 336
(e) 96

15. The perimeter of a rectangle is 7 in. and the width is $1\frac{3}{4}$ in. Find the length.

(a) $1\frac{3}{4}$ in.
(b) $1\frac{1}{4}$ in.
(c) 2 in.
(d) $1\frac{7}{8}$ in.
(e) 7 in.

16. The smallest prime number is

(a) 2
(b) 1
(c) 3
(d) there is no smallest prime
(e) none of the above

17. The Bluefield High School football team won 75% of its games last year, and this season won two more games than last year. How many games did they win this season if they played 12 games each year?

(a) 9
(b) 10
(c) 11
(d) 12
(e) 24

18. If the equation, $2 + 3 \cdot 4 * 2 - 4 \cdot 2 = 0$ is true, then the symbol, *, must represent

(a) addition
(b) subtraction
(c) multiplication
(d) division
(e) not true for any of these

19. How many arrangements of the letters, ABCDEF, are possible if A and E must always be together?

(a) 720
(b) 240
(c) 48
(d) 120
(e) none of these

20. Sadie spent 20% of her savings, but she still had $12.80. How much money had she saved?

(a) $18.00
(b) $20.00
(c) $16.00
(d) $15.36
(e) none of the above

21. $24 + 6 \div 3 + 7 - 2 \cdot 4 =$

(a) 60
(b) 51
(c) 25
(d) 46
(e) 81

22. If today is Tuesday, what day of the week will it be 200 days from now?

(a) Wednesday
(b) Thursday
(c) Friday
(d) Saturday
(e) none of these

23. Find the base two numeral for 52_{eight}.

(a) 101010_{two}
(b) 110100_{two}
(c) 111010_{two}
(d) 101110_{two}
(e) 111100_{two}

24. A bag contains 5 red marbles, 3 blue marbles and 2 white marbles. A marble is drawn at random from the bag. What is the probability that the marble drawn is not white?

(a) $\frac{2}{10}$
(b) $\frac{3}{10}$
(c) $\frac{5}{10}$
(d) $\frac{8}{10}$
(e) 0

25. A television set is packed in a crate that is in the shape of a cube. The measure of one edge of the crate is $2\frac{1}{2}$ ft. The surface area of the crate is

(a) $\frac{25}{4}$ sq. ft.

(b) $\frac{75}{8}$ sq. ft.

(c) 25 sq. ft.

(d) $\frac{75}{2}$ sq. ft.

(e) $\frac{75}{4}$ sq. ft.

26. John can mow the lawn in 3 hours but it takes his little sister Jill 6 hours. If they use two mowers and work together, how long would it take to mow the lawn?

(a) 9 hours

(b) $4\frac{1}{2}$ hours

(c) $1\frac{1}{2}$ hours

(d) $2\frac{1}{2}$ hours

(e) 2 hours

27. In a group of 300 seventh and eighth grade students, 45% are eighth graders and 60% of the eighth graders are girls. How many eighth grade girls are there?

(a) 75

(b) 87

(c) 54

(d) 81

(e) none of these

28. Which of these fractions has decimal representation, .272727...

(a) $\frac{2}{7}$

(b) $\frac{27}{100}$

(c) $\frac{3}{11}$

(d) $\frac{2}{9}$

(e) $\frac{4}{15}$

29. Casey hit safely 40% of the times he was at bat. He had 80 hits. How many times was he at bat?

(a) 32

(b) 320

(c) 160

(d) 80

(e) 200

30. Operations that are associative on the rational numbers are

(a) addition and subtraction
(b) subtraction and division
(c) addition and multiplication
(d) addition and division
(e) all of these

31. In rounding 63,485, which choice is clearly incorrect?

(a) 63,490
(b) 63,480
(c) 63,500
(d) 64,000
(e) 60,000

32. If state and local sales tax is 6% on all sales, and gross receipts for the day were $1,000.00 including tax, what was the total sales for the day?

(a) $1,060.00
(b) $60.00
(c) $940.00
(d) $943.40
(e) $940.60

33. $1 + 2 + 3 + 4 + \cdots + 99 =$

(a) 425
(b) 4,550
(c) 4,950
(d) 5,025
(e) 10,147

34. A circle of radius r is inscribed in a square. Find the area of the region between the circle and the square.

(a) $4r^2 - \pi r^2$
(b) $r^2 - \pi r^2$
(c)* $4r^2 - 4\pi r^2$
(d) $2r^2 - \pi r^2$
(e) none of the above

35. A fair coin is tossed 3 times. What is the probability of getting 3 heads?

(a) $\frac{1}{2}$
(b) $\frac{1}{6}$
(c) $\frac{1}{8}$
(d) $\frac{3}{8}$
(e) $\frac{1}{9}$

36. Given $f : m \rightarrow \frac{2m + 4}{2}$ then $f(5) =$

(a) 5
(b) 2
(c) $\frac{7}{2}$
(d) 4
(e) 7

37. In any polyhedron, number of vertices + number of faces - number of edges =

(a) 0
(b) 1
(c) 2
(d) 3
(e) 4

38. Simplify the expression $\frac{3 + \frac{5}{3} + \frac{1}{2}}{\frac{1}{6} + \frac{1}{2 - \frac{4}{5}}}$.

(a) $\frac{99}{5}$
(b) $\frac{9}{6}$
(c) $\frac{9}{55}$
(d) $\frac{9}{5}$
(e) $\frac{31}{6}$

39. Fill in the blanks so that 13__, 527,623 is divisible by 9.

(a) 0
(b) 7
(c) 4
(d) 2
(e) 8

40. A right circular cylinder with height 6 cm, diameter 5 cm (no ends) has surface area S sq. cm. Which of the following is true?

(a) $60 \leq S < 90$
(b) $90 \leq S < 120$
(c) $120 \leq S < 150$
(d) $150 \leq S < 180$
(e) $180 \leq S \leq 210$