AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE 37040

Junior High School Mathematics Competition

SEVENTH GRADE TEST

1986

SCORING FORMULA: 4R - W + 40

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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

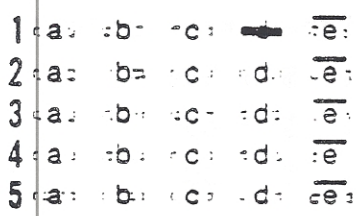
   (a) 0

   (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. $12 + 18 \div 6 - 4 =$

   a. 1
   b. 9
   c. 15
   d. 11
   e. not given

2. Let a represent an odd number and b represent an even number. Then a + b must represent:

   a. a prime number
   b. a composite number
   c. an odd number
   d. an even number
   e. an abundant number

3. The difference between the largest number and the smallest number in the set, {.6, .65, .605, .6005 } is:

   a. .045
   b. .0045
   c. .0005
   d. .005
   e. .05

4. The statement, 3 + (4 + 5) = (4 + 5) + 3 is an example of the:

   a. distributive property
   b. commutative property of addition
   c. associative property of addition
   d. commutative property of multiplication
   e. associative property of multiplication

5. Ribbon costs 30 cents per foot. What is the total cost of three pieces measuring 1½ ft., 2 ft., and 15 inches ?

   a. $ 5.55
   b. $ .55
   c. $ 1.43
   d. $ 1.45
   e. $ .80

6. Thirty students' names are in a box for a drawing for two prizes. No one person can win both prizes. What is the probability that a student who does not win the first prize will win the second ?

   a. 1/15
   b. 1/29
   c. 1/30
   d. 1/870
   e. 2/29

7. The perimeter of a rectangle is 20 feet. The area of the same rectangle is 16 square feet. Find the length of a shorter side.

   a. 2 ft.
   b. 8 ft.
   c. 10 ft.
   d. 4 ft.
   e. 5 ft.

8. $23_b = 15_{10}$. Find the base, b.

a. 8 b. 5

c. 6 d. 4

e. 7

9. A farmer had 13 sheep. All but 9 of the sheep died. How many sheep did the farmer have left alive ?

a. 4 b. 9

c. 22 d. can't tell

e. not given

10. Find the solution for the open sentence, $\frac{1}{3} X + 5 = \frac{2}{3} X$.

a. 5 b. 15

c. 5/3 d. 14/3

e. 0

11. A circular pond is approximately 20 meters across. How far is it around the pond ?

a. 102 meters b. 14 meters

c. 126 meters d. 63 meters

e. 682 meters

12. One number is seven more than another number. What is the product of the two numbers if three times the larger exceeds four times the smaller by five ?

a. 30 b. 144

c. 368 d. 494

e. not given

13. How many rational numbers are there between 1 and 3 ?

a. 1 b. 3

c. unknown d. 0

e. an infinite number

14. If you start with all the whole numbers between 1 and 20 and eliminate all the prime numbers, what is the sum of all the remaining odd numbers ?

a. 24 b. 38

c. 17 d. 14

e. 20

15. A recipe that serves 10 people calls for 3/4 cup of vinegar. How much vinegar should be used in making enough to serve only four people ?

a. 3/16 cup
b. .3 cup
c. 1/4 cup
d. 1.875 cup
e. 1/3 cup

16. How much sales tax is owed if the purchase price is $ 952.18 and the tax rate is 7 3/4 % for the first $ 500 and 3 % for any amount over $ 500 ?

a. $ 52.32
b. $ 50.04
c. $ 102.35
d. $ 22.13
e. $ 40.25

17. If two balanced coins are tossed, what is the probability that both will land showing heads ?

a. 1/2
b. 1/3
c. 1/4
d. 1/5
e. 1/8

18. $(a)(b/\sqrt{10})(1/\sqrt{10}) =$

a. $(a)(b+1)/\sqrt{10}$
b. $a^2b/10$
c. $ab/\sqrt{20}$
d. $(ab + a)/10$
e. $ab/10$

19. A student has scores of 78, 85, 88, and 90 on four tests. What would the student have to make on a fifth test to have a cumulative average of at least 85 on all five tests ?

a. 84
b. 98
c. 86
d. 92
e. 78

20. 298 billion can be written in scientific notation as:

a. 2.98×10^8
b. 2.98×10^5
c. 2.98×10^{14}
d. 2.98×10^{11}
e. not given

21. If you square a certain number, subtract twice the number, then add 1, you get zero. What is the number ?

a. 0
b. -1
c. 2
d. -2
e. 1

22. The least common multiple of 6, 8, and 12 is:

a. 2
b. 48
c. 1
d. 24
e. not given

23. In a trapezoid, the sum of the measures of the angles is:

a. 180 degrees
b. 360 degrees
c. 540 degrees
d. variable
e. not given

24. $.\overline{27}$ =

a. 27/100
b. 1/27
c. 3/11
d. 17/62
e. 8/30

25. Ten kilometers is closest to:

a. 10 miles
b. 5 miles
c. 4 miles
d. 18 miles
e. 6 miles

26. Pi, the ratio of the circumference and the diameter of a circle, is closest in value to:

a. 22/7
b. 3.14
c. 3.1416
d. 3.1425
e. 3.140918

27. If the two longest sides of a right triangle measure 15 cm and 11 cm, the third side measures approximately:

a. 4 cm
b. 6 cm
c. 8 cm
d. 10 cm
e. 12 cm

28. Given a square with side measuring s units, if the side were increased by 3 units, the area of the resulting square would be increased by:

a. 9 square units
b. 6s + 9 square units
c. 9s square units
d. s^2 + 6s + 9 square units
e. s^2 + 9 square units

29. If Sophia bought a jacket at a discount of 20 %, saving $ 6.50 off of the regular price, how much did she pay for the jacket ?

a. $ 26.00
b. $ 32.50
c. $ 7.80
d. $ 13.00
e. not given

30. If a, b, and c are integers and ac = bc, then:

a. a = b
b. a + b = c
c. a - b = c
d. ab = c
e. a = b or c = 0

31. If today were Sunday, what day of the week would it be 500 days from today ? (Tomorrow is one day from today.)

a. Monday
b. Wednesday
c. Friday
d. Tuesday
e. Saturday

32. One ball is drawn randomly from a bag containing 4 blue balls, 6 yellow balls, and 5 red balls. What is the probability that the ball that is drawn is not red ?

a. 2/5
b. 2/3
c. 3/5
d. 3/4
e. 1/3

33. If you invested $ 2500 in an account that pays the annual rate of 12 % interest, compounded monthly, what would your investment be worth in two months ?

a. $ 50.00
b. $ 50.25
c. $ 2550.25
d. $ 2550.00
e. $ 2800.00

34. The last digit of an integer between 700 and 900 is 3. We can be sure that the integer is not:

a. a multiple of 9
b. a multiple of 7
c. a prime number
d. a perfect square
e. a rational number

35. The binary numeral, 11 010 110 101 111, written in base eight, is:

a. 32657
b. 63725
c. 34107
d. 42571
e. 64375

36. If 2/3 of the members of an organization voted on a certain question and it passed by the count of 26 to 24, what percent of the entire membership voted for the measure in question ?

a. 78 %
b. 48 %
c. 52 %
d. 67 %
e. 35 %

37. In a certain country, the unit of currency is the bink. If you ask for change for a one bink bill, you will probably be given 2 jubs, 2 meps, and a veek, although you might be given 3 jubs instead. If there are 3 veeks in a mep, how many veeks are there in a bink ?

a. 42
b. 21
c. 9
d. 7
e. 5

38. If a square is inscribed in a circle with radius 10 feet, what is the area enclosed between one side of the square and the circle (outside of the square) ?

a. 100π - 50 square feet
b. 2.5π - 50 square feet
c. 25π - 100 square feet
d. 25π - 50 square feet
e. 100π - 25 square feet

39. On a family trip to Florida for Spring break, the Jones family averaged 55 miles per hour on the way down and 45 mph coming back. What speed did they average for the driving down and back ?

a. need more information
b. 50 mph
c. 49.5 mph
d. 50.5 mph
e. not given

40. A man has purchased five trees of different varieties to plant along the front of his lawn. How many different arrangements of the trees are possible after the spots for planting have been selected ?

a. 25
b. 3125
c. 5
d. 120
e. 125