AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE

MIDDLE TENNESSEE STATE UNIVERSITY
MURFREESBORO, TENNESSEE

UNIVERSITY OF TENNESSEE AT MARTIN
MARTIN, TENNESSEE

JUNIOR HIGH/MIDDLE SCHOOL
MATHEMATICS COMPETITION

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Eighth Grade Test
1994
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.
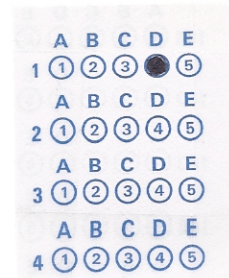
SAMPLE:

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 d), so you would answer this problem by darkening the space on the answer sheet corresponding with this choice.

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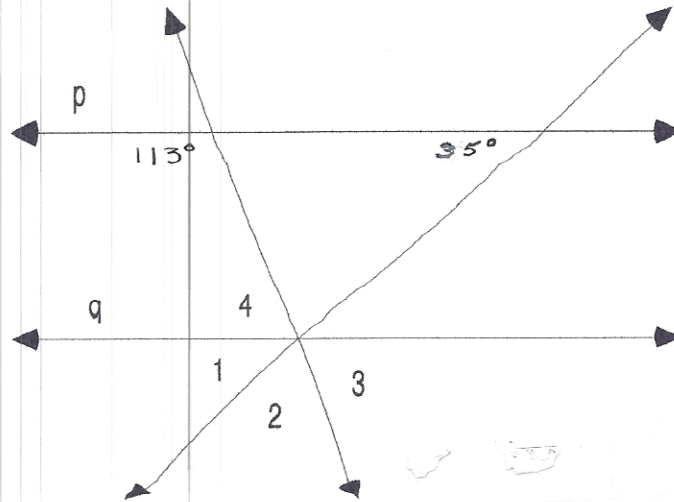
When told to do so, open your test booklet and begin. When you have finished one page, go on to the next. The working time for the entire test is 80 minutes.

1. $-8 \cdot (-24) \cdot (-4)$

    a) -768
    b) -486
    c) -36
    d) 38
    e) 768

2. The greatest common divisor of 92, 116, and 72 is

    a) 1
    b) 2
    c) 4
    d) 6
    e) 8

3. The least common multiple of 27, 42, and 63 is

    a) 378
    b) 385
    c) 398
    d) 478
    e) 498

4. $20\frac{5}{6} + 17\frac{11}{12} + 13\frac{1}{4} =$

    a) 48
    b) 50
    c) 51
    d) 52
    e) 459

5. The students in Mrs. Webster's class are standing in a circle.
    They are evenly spaced and numbered in order. The student with
    number 5 is standing directly across from the student with number
    23. How many students are in the class?

    a) 23
    b) 28
    c) 34
    d) 36
    e) 105

6. 58.8 is 140% of what number?
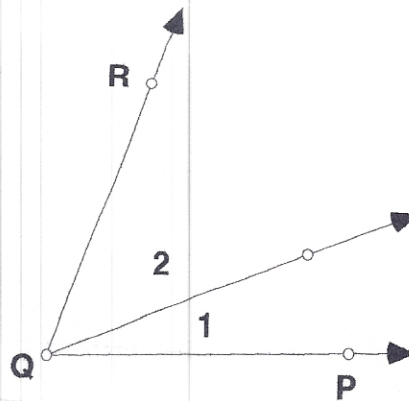
    a) 0.42
    b) 4.2
    c) 42
    d) 82.32
    e) 8232

7. At the beginning of the month, Norm owes his credit card company $688. During the month, he uses the card to make purchases of $71, $45, $70, and $83. He sends in a payment of $20 and returns some merchandise for $47, which is credited to his account. If no finance or other charges are assessed, how much does he owe at the end of the month?

   a) $525
   b) $750
   c) $890
   d) $920
   e) $930

8. Joan purchased 6 yards of material to make stuffed animals for a spring carnival. Each stuffed animal requires $\frac{3}{10}$ yards of material. How many stuffed animals can Joan make from the material?

   a) 20
   b) 21
   c) 22
   d) 23
   e) 25

9. Exactly one of the following sentences is true. Identify the one which is true.

   a) $\frac{1}{2} < \frac{1}{3} < \frac{1}{4}$

   b) $\frac{1}{2} < \frac{1}{4} < \frac{1}{3}$

   c) $\frac{1}{2} < \frac{3}{7} < \frac{1}{3}$

   d) $\frac{1}{3} < \frac{1}{2} < \frac{3}{7}$

   e) $\frac{1}{3} < \frac{3}{7} < \frac{1}{2}$

10. Last week Mrs. Baker's cats got into Mrs. Murphy's chicken coop with her chickens. During the commotion, I counted 21 heads and 50 feet. None of the animals was harmed. How many of Mrs. Baker's cats were in the coop?

    a) 17 cats
    b) 15 cats
    c) 12 cats
    d) 6 cats
    e) 4 cats

11. If lines p and q are parallel, find the measure of ∠3.

    a) 53°
    b) 60°
    c) 67°
    d) 78°
    e) 113°

12. If m∠1 = 20° and m∠PQR = 75°, find m∠2.
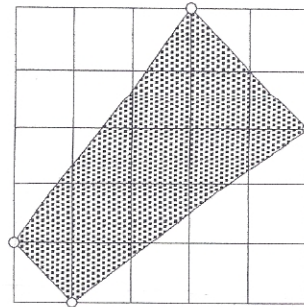

    a) 20°
    b) 55°
    c) 75°
    d) 95°
    e) 96

13. How many diagonals does a 40-gon (a polygon with 40 sides) have?

    a) 10
    b) 20
    c) 40
    d) 520
    e) 740

14. ∠DEF and ∠GHI are complementary angles and ∠GHI is fourteen times as large as ∠DEF. Determine the measure of ∠GHI.

    a) 70°
    b) 83°
    c) 84°
    d) 85°
    e) 98°

18. Find the area of the shaded region if the area of one small

    square ⬜ is one square unit.
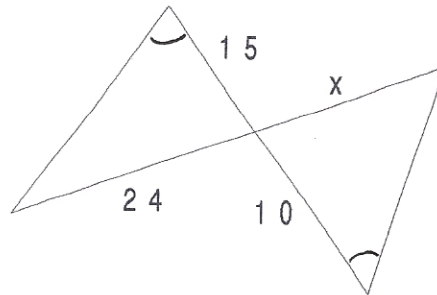
    a) 9.5
    b) 10
    c) 10.5
    d) 12.5
    e) 13

19. A collection of dimes and quarters is worth $6.00. How many
    quarters are there if the number of dimes is 5 less than four
    times the number of quarters?

    a) 10 quarters
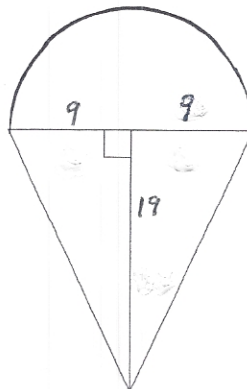   b) 8 quarters
    c) 6 quarters
    d) 4 quarters
    e) 2 quarters

20. Find the value of x in the figure below. The angles opposite x
    and opposite 24 are congruent.

    a) 75/12
    b) 15
    c) 16
    d) 24
    e) 36

21. Find the area of the figure.

    a) $342 + (81/2)\pi$
    b) $171 + 81\pi$
    c) $341 + 81\pi$
    d) $171 + (81/2)\pi$
    e) $171 + (82/4)\pi$

22. The designs below are made with toothpicks. It takes 4
    toothpicks to make a one-square design. It takes 7 toothpicks to
    make a 2-square design. How many toothpicks will it take to make
    a 100-square design?

    a) 101
    b) 300
    c) 301
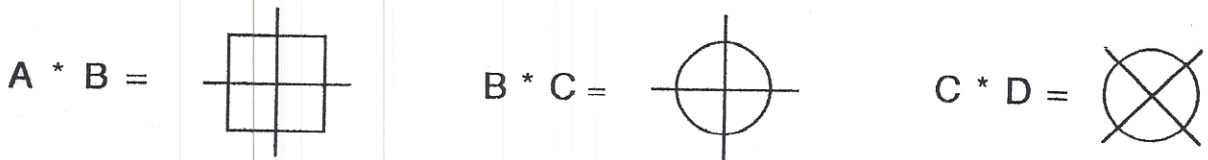   d) 400
    e) 401

23. The Valley Restaurant Association wanted to determine the
    popularity of its restaurants. It surveyed 33 people in
    the past month and the results show that:

        16 people ate at Ruth's Ribs
         7 people ate at Patty's Pasta
        18 people ate at Danny's Diner
         7 people ate at Ruth's and Danny's
         3 people ate at Danny's and Patty's
         5 people ate at Ruth's and Patty's
         3 people ate at all three restaurants

    Find the number of people in the survey who did not eat at any of
    the restaurants.

    a) 2
    b) 3
    c) 4
    d) 5
    e) 6

24. The following operations are defined as follows:

    A * B =   B * C =   C * D =

    Which representation shows A * D?

    a)   b)   c)   d)

    e)

8-6

25. Ben picks berries for a week during the summer. Each day he picks 2 lbs. more berries than he did the day before. By the end of the 7th day, he has picked 357 pounds in all. How many pounds did Ben pick the first day?

    a) 43 lbs.
    b) 45 lbs.
    c) 47 lbs.
    d) 49 lbs.
    e) 50 lbs.

26. I am thinking of a whole number. If I divide it by 14, then multiply by 12, then subtract 18, and then add 58, I end up with 100. What was my original number?

    a) 50
    b) 65
    c) 70
    d) 80
    e) 95

27. If it takes 30 seconds to make each cut, how long will it take to cut 14 boards that are 15 feet long into boards that are 5 feet long if only one cut can be made in one board at a time?

    a) 13 minutes
    b) 15 minutes
    c) 14 minutes
    d) 18 minutes
    e) 21 minutes

28. Find the least number divisible by each of these natural numbers:
       3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.

    a) 310,310
    b) 320,320
    c) 340,340
    d) 360,360
    e) 380,380

29. Hans makes $0.32 profit on every box of candy he sells. On Friday he decides to spend all of his profits on his friends. He buys each one a medium soda at $0.68 each. If he has no money left over, what is the least number of friends Hans might have?
    a) 5 friends
    b) 6 friends
    c) 7 friends
    d) 8 friends
    e) 9 friends

30. 4593 x 3126 =

    a) 14,357,718
    b) 14,357,717
    c) 14,357,716
    d) 14,357,715
    e) 14,357,714

31. Fill the blank with one digit to make the following true.   (Find
    all possible answers.)   6 evenly divides 28__4.

    a) 1, 4 and 7
    b) 1
    c) 9
    d) 7 and 9
    e) 4

32. Three partners in a small business own all of the stock in the
    ratio 3:4:3.   If the total stock is valued at $599,990, what is
    the value of each partner's shares, listed in the same order as
    their ratios?

    a) $179,997; $239,996; $179,997
    b) $189,997; $220,005; $189,997
    c) $199,997; $199,996; $199,997
    d) $169,997; $259,996; $169,997
    e) $169,997; $169,997; $259,996

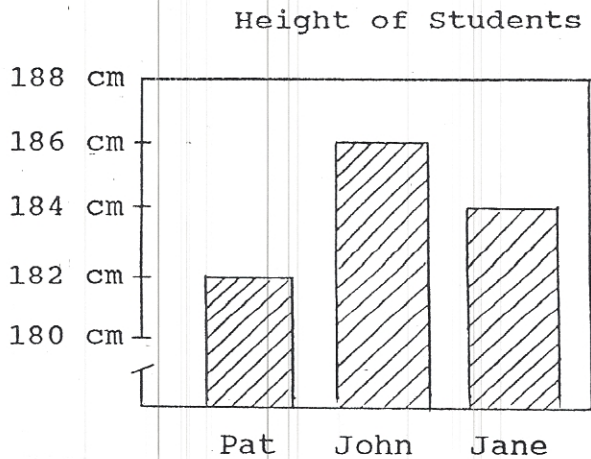33. Three painters can paint 4 houses in 8 days.   How long will it
    take 5 painters to paint 25 houses if all work is done at the
    same rate?

    a) 20 days
    b) 25 days
    c) 30 days
    d) 35 days
    e) 40 days

34. Solve for the integer n in the following: $2^n \cdot 2^7 = 16$

    a) -5
    b) -4
    c) -3
    d) 3
    e) 5

35.

Height of Students

Which of the following statements is true?

a) John is twice as tall as Pat.
b) Jane is one cm shorter than John.
c) John is two cm taller than Pat.
d) John is more than two meters tall.
e) Pat is four cm shorter than John.

36. $\dfrac{\dfrac{1}{2} - \dfrac{1}{10}}{\dfrac{2}{5} + \dfrac{1}{15}} =$

a) 8/15
b) 2/3
c) 6/7
d) 8/9
e) 9/10

37. At Ajax Trucking, three times as many men as women apply for work. If 1/6 of the applicants are hired and 1/12 of the men who apply are hired, what fraction of the women who apply are hired?

a) 1/72
b) 7/72
c) 5/12
d) 5/11
e) 7/12

38. Over the last three years Chris has received raises of 5%, 4%, and 5%, respectively. What is the actual percent increase (to the nearest tenth of a percent) in Chris's salary?

   a) 0.0%
   b) 14.0%
   c) 14.7%
   d) 15.0%
   e) 15.8%

39. A box contains 5 red, 6 green, and 9 yellow marbles. If one marble is drawn at random, find the probability it is red or yellow.

   a) 9/80
   b) 1/4
   c) 3/10
   d) 9/20
   e) 7/10

40. A teacher has prepared a 10-item test with the first 5 items being true or false and the last 5 items being multiple choice with three choices each. What is the probability that a student will score 0 if every answer is chosen at random?

   a) 1/10
   b) 1/243
   c) 1/1024
   d) 1/10000
   e) 1/32768