

1997 SIXTH GRADE MATHEMATICS COMPETITION

AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE

UNIVERSITY OF TENNESSEE AT MARTIN
MARTIN, TENNESSEE

Sixth Grade Test
1997
Scoring Formula: $4R - W + 40$

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DIRECTIONS:

This is a test of your competence in middle 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

	A	B	C	D	E
1	①	②	③	④	⑤
	A	B	C	D	E
2	①	②	③	④	⑤
	A	B	C	D	E
3	①	②	③	④	⑤

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 60 minutes.

SIXTH GRADE TEST
JUNIOR HIGH/MIDDLE SCHOOL
MATH CONTEST

1. Which of the following could not be the measures of the four angles of a quadrilateral?

- a) $38^\circ, 42^\circ, 130^\circ, 150^\circ$
- b) $95^\circ, 85^\circ, 45^\circ, 140^\circ$
- c) $75^\circ, 100^\circ, 95^\circ, 90^\circ$
- d) $90^\circ, 90^\circ, 90^\circ, 90^\circ$
- e) $75^\circ, 85^\circ, 107^\circ, 93^\circ$

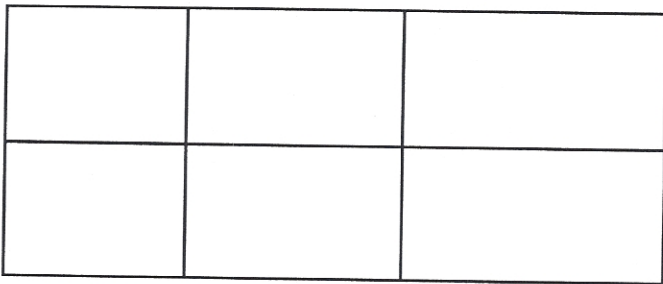
2. A box contains 80 marbles. Five of them are blue. What percent of the marbles are blue?

- a) 6.25%
- b) 5%
- c) 8%
- d) 0.0625%
- e) 62.5%

3. In right triangle ABC, with angle C being the right angle, the measure of angle A is 53 degrees. What is the measure of angle B?

- a) 90° b) 53° c) 45° d) 97° e) 37°

4. How many rectangles are there in the picture below?



- a) 6 b) 1 c) 7 d) 18 e) 15

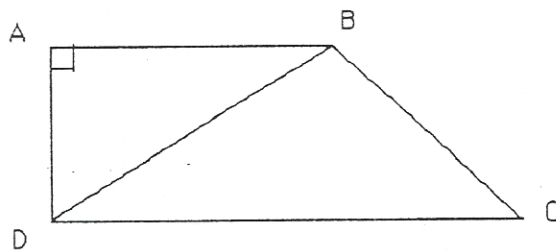
5. A square corner section that measures 12 inches by 12 inches is cut from a square piece of carpet that measures 6 feet by 6 feet. What fractional part of the carpet has been removed?

- a) $1/36$ b) $1/6$ c) $24/36$ d) $1/8$ e) $1/18$

6. A bowl contains 15 red marbles, 20 white marbles and 30 green marbles. If a marble is drawn at random from the bowl, what is the probability that the marble is not red?

- a) $3/13$ b) $6/13$ c) $10/13$ d) $7/13$ e) 1

7. There are 21 students seated at their desks in a classroom and there are 4 vacant desks. What percent of the desks in the classroom are vacant?
- a) 4% b) 16% c) 84% d) 8% e) about 19%
8. A farmer needs to fence a rectangular piece of land. He wants the length of the field to be 80 feet longer than the width. If he has 1080 feet of fencing material, what should the length and width of the field be?
- a) 1080 ft. by 1000 ft.
 b) 580 ft. by 500 ft.
 c) 530 ft. by 450 ft.
 d) 570 ft. by 490 ft.
 e) 310 ft. by 230 ft.
9. Mark has exactly \$1.50 in change in his pocket. He remembers that he has only quarters, dimes, nickels and pennies and that he has at least one of each. What is the least number of coins that he could have?
- a) 13 b) 8 c) 17 d) 18 e) 6
10. How many other four-digit numbers have the same digits as 1996? Do not count 1996.
- a) 12 b) 24 c) 23 d) 10 e) 11
11. Two houses on the same street are separated by a large field. The first house is numbered 29, and the last is numbered 224. A developer plans to build 14 more houses between the two existing houses. What should the common difference be if all of the house numbers must form an arithmetic sequence?
- a) 12 b) 10 c) 14 d) 13 e) 5
12. Find the measure of angle CBD given that ABCD is a trapezoid, the measure of angle BDC is 30 degrees, and the measure of angle BCD is 40 degrees.

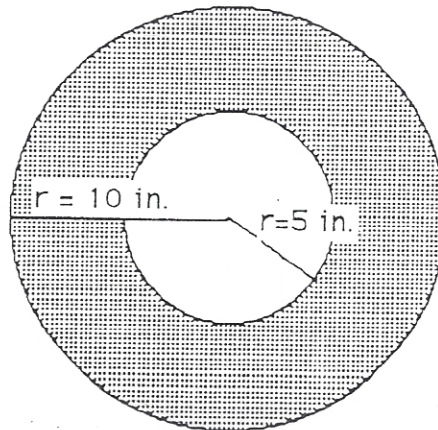


- a) 30° b) 110° c) 40° d) 70° e) 120°

13. In the product below, A represents a digit. Find the value of A that makes the product correct.

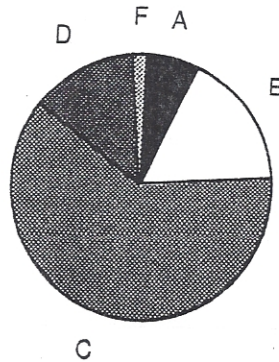
$$\begin{array}{r} A2 \\ \times 4A \\ \hline 3384 \end{array}$$

- a) 8 b) 9 c) 4 d) 6 e) 7
14. On a map $\frac{1}{4}$ inch represents 10 miles. If the distance between two cities is 85 miles, how far apart are they on the map?
- a) 2 inches b) $2\frac{1}{4}$ inches c) $8\frac{1}{2}$ inches d) $2\frac{1}{8}$ inches e) $4\frac{1}{8}$ inches
15. Prior to starting a trip, when the mileage odometer read 42,800 miles, Joann needed 8 gallons of gas to fill her car's gas tank. When the odometer read 43,030 she filled the tank with 12 gallons of gas. At the end of her trip she filled the tank with 18 gallons of gas and the odometer read 43,390 miles. To the nearest 0.1 mpg, how many miles per gallon (mpg) did she get on the trip?
- a) 15.5 mpg b) 19.7 mpg c) 19.2 mpg d) 20.0 mpg e) 29.5 mpg
16. A carpenter's wage this year is \$19.80 per hour. This is 110% more than his wage was last year. To the nearest cent, what was his hourly wage last year?
- a) \$21.78 b) \$9.43 c) \$18.00 d) \$12.50 e) \$15.75
17. The area of the shaded region is what fractional part of the area of the larger circle?

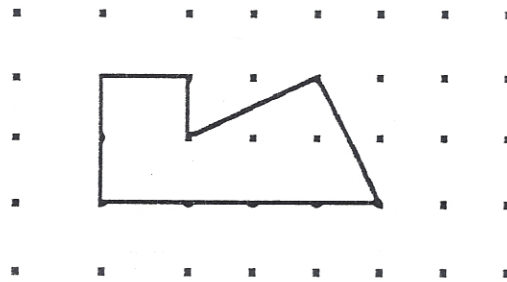


- a) $\frac{1}{2}$ b) $\frac{2}{3}$ c) $\frac{1}{\pi}$ d) $\frac{\pi}{2}$ e) $\frac{3}{4}$
18. The letter "A" represents the units digit in the five-digit number 15,72A. What is the value of A if nine exactly divides the number?
- a) 3 b) 4 c) 6 d) 9 e) 7

19. The pie chart given below shows the grade distribution for Mrs. Bell's class. The approximate percentage of students getting a grade of B is best given by

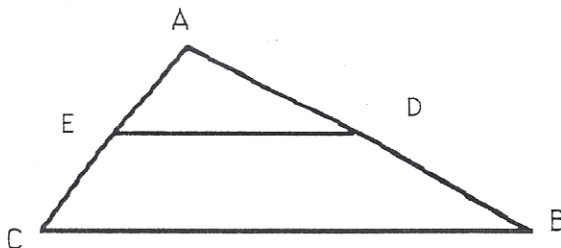


- a) 25% b) 10% c) 18% d) 5% e) 30%
20. In the picture below, the horizontal and vertical distance between two dots is one unit. Find the area of the figure drawn.

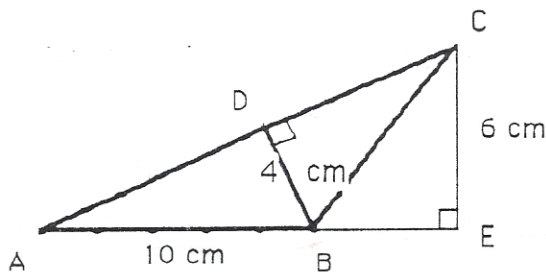


- a) 6 sq. units b) 10 sq. units c) 12 sq. units d) 5 sq. units e) 8 sq. units
21. Some of the divisors of a locker number are known to be 2, 5, and 9. If there are exactly nine additional divisors, what is the locker number?
- a) 180 b) 278 c) 360 d) 90 e) 45
22. The greatest common divisor of 108 and 72 is
- a) 2 b) 36 c) 12 d) 4 e) 216
23. The least common multiple of 108 and 72 is
- a) 216 b) 36 c) 12 d) 4 e) 7776

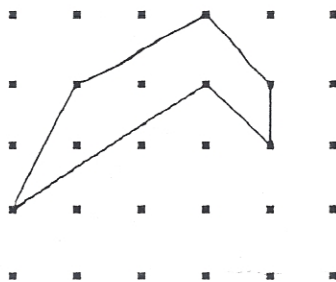
24. In the following figure the two triangles are similar. Segment DB is 8 inches long, segment AE is 3 inches long and segment EC is 4 inches long. What is the length of segment AD?



- a) 4 inches b) 5 inches c) 6 inches d) 7 inches e) 8 inches
25. A 15-ft ladder is leaning against a wall. The base of the ladder is 5 feet from the wall. Which of the following is the best approximation of the height of the ladder above the ground?
- a) 15 feet b) 14 feet c) 13 feet d) 12 feet e) 11 feet
26. In the following figure, segment AB is 10 cm long, segment BD is 4 cm long, and segment CE is 6 cm long. What is the area of triangle ABC?

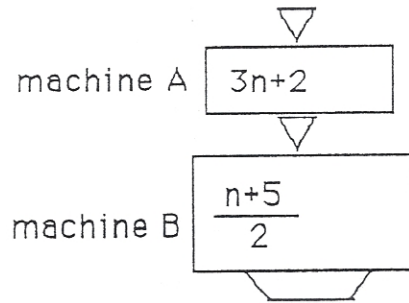


- a) 40 cm^2 b) 20 cm^2 c) 30 cm^2 d) 60 cm^2 e) 20 cm^2
27. In the picture below, the horizontal and vertical distance between two dots is one unit. Find the area of the figure drawn.



- a) 4 sq. units b) 5 sq. units c) 3 sq. units d) 2 sq. units e) 6 sq. units

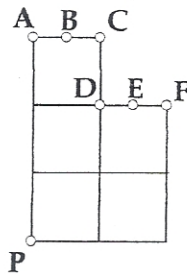
28. How many terms are in the arithmetic sequence 3, 7, 11, 15, 19, \dots , 403?
- a) 403 b) 100 c) 101 d) 102 e) 99
29. The picture below shows two “function machines” that are connected. The number that comes out of machine A goes directly into machine B, and then machine B outputs a number. When 5 goes into machine A, 11 comes out of machine B. What number must be put into machine A to get an output of 14 from machine B?



- a) 14 b) 7 c) 11 d) 23 e) 71
30. How many divisors does the number $2^3 \cdot 3^4 \cdot 5^3 = 81,000$ have?
- a) 3 b) 36 c) 20 d) 1080 e) 80
31. Which of the following is the best estimate for 792×486 ?
- a) 40,000 b) 280,000 c) 400,000 d) 320,000 e) 32,000
32. How many numbers between 100 and 200 contain the digit 3?
- a) 9 b) 10 c) 19 d) 25 e) 18
33. What is the measure of the angle between the hour hand and the minute hand of a clock at 3:30?
- a) 45° b) 90° c) 35° d) 75° e) 85°
34. If $3x - 4y = 5$, then $9x - 12y - 25 =$
- a) -10 b) 15 c) -5 d) -20 e) 25
35. Which of the following cannot be the lengths of the sides of a right triangle?
- a) 5, 12, 13 b) 10, 24, 26 c) 5, 6, 7 d) 3, 4, 5 e) 6, 8, 10

36. The cost for mailing a first class letter is 32 cents for the first ounce and 23 cents for each additional ounce. What is the cost of mailing a 7 ounce letter?
- a) \$2.24 b) \$1.61 c) \$1.93 d) \$1.70 e) \$2.15
37. If the radius of a circle is 4 cm, then the best estimate for the circumference of the circle is
- a) 13 cm b) 20 cm c) 50 cm d) 30 cm e) 25 cm
38. Which of the following sets has a 2:3 ratio of even numbers to odd numbers?
- a) {1, 2, 3, 4}
 b) {1, 2, 3, 4, 5, 6, 7, 8, 9, 11}
 c) {2, 3, 4, 5, 6, 7, 8, 9, 10}
 d) {5, 6, 7, 8, 9, 10, 11, 12, 13}
 e) {1, 2, 3, 4, 5, 6, 7}

39. In the figure below B is the mid-point of segment AC and E is the mid-point of segment DF. If the line segment PX divides the area into polygons of equal area then X =



- a) C b) F c) E d) B e) D
40. Looking out into the yard one day, I saw an assortment of girls and cats. Counting heads I got 22. Counting feet I got 68. How many girls were in the yard?
- a) 9 b) 10 c) 11 d) 12 e) 13