

1998 SIXTH GRADE MATHEMATICS COMPETITION

AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE

UNIVERSITY OF TENNESSEE AT MARTIN
MARTIN, TENNESSEE

Sixth Grade Test
1998
Scoring Formula: $4R - W + 40$

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	●	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.

1. Which of the following number sentence(s) are true?

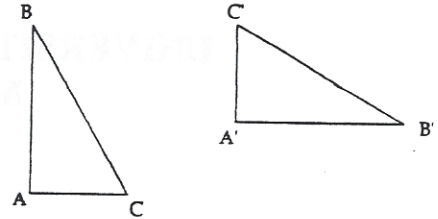
A. $5 \div 0 = 0$

B. $0 \div 5 = 0$

C. $8 \div \frac{1}{2} = 4$

- a) only A b) only B c) only C d) only B & C e) only A & C

2. Which motion(s) of $\triangle ABC$ produce the image shown?



- a) a turn b) a flip c) a slide d) a turn followed by a flip
e) a turn followed by a slide

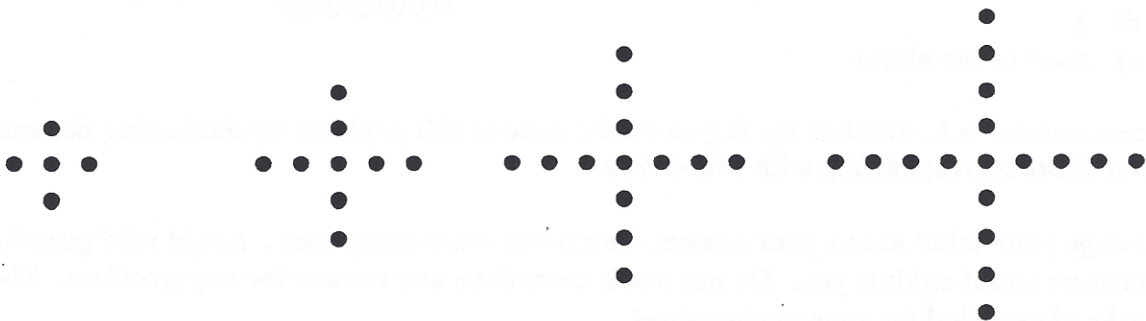
3. John's average of his five history test scores is 85. The first three scores are 76, 94 and 90. What is the sum of the last two test scores?

- a) 85 b) 160 c) 180 d) 170 e) 165

4. Which number is between 0.7 and 0.725?

- a) 0.73 b) 0.7258 c) $0.7\bar{2}$ d) $0.\bar{7}$ e) 0.699

5. The first four figures in the sequence are shown here.



How many dots are in the tenth figure of the sequence?

- a) 21 b) 35 c) 40 d) 41 e) 45

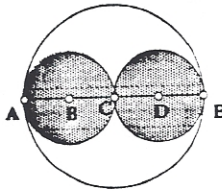
6. Which point best represents $x + y$?



- a) A b) B c) C d) D e) E

7. In the figure shown here, point C is the center of the large circle. Point B is the center of the smaller circle on the left. Point D is the center of the smaller circle on the right. $AB = CD = 1$.

What is the ratio of the area of the shaded area to the unshaded area?



- a) 1:1 b) $1:2\pi$ c) $\pi:2\pi$ d) 2:3 e) 1:4

8. Which of the given digits will make the following statement true:

6 is a factor of $4,003,972,7 _ 2$

- a) 1 b) 2 c) 3 d) 4 e) 6

9. A notebook costs \$1.25 more than 3 pencils. The pencils all cost the same amount. The total price of the notebook and the 3 pencils is \$2.15. What is the price of one pencil?

- a) 5¢ b) 10¢ c) 15¢ d) 20¢ e) 25¢

10. All cupcakes have the same price. All cookies have the same price. A cupcake does not necessarily cost the same as a cookie. If two cookies and one cupcake cost \$1.67 and one cookie and two cupcakes cost \$1.87, then how much does one cookie and one cupcake cost?

- a) \$1.18 b) \$1.54 c) \$2.54 d) \$3.54 e) \$3.67

11. If three eighths of a pound of hamburger costs \$0.57, then how much does two pounds of hamburger cost?
- a) 38¢ b) \$1.52 c) \$1.14 d) \$3.04 e) \$4.56
12. If your heart beats an average of 68 times every minute, which is the closest estimate to the number of times it beats in one day?
- a) 1,000,000 b) 500,000 c) 100,000 d) 25,000 e) 1,000
13. Lynn and Kim rented a pasture together for \$14. Lynn put 4 oxen in the pasture. Kim put 30 sheep in the pasture. If 1 ox eats as much as 10 sheep, how much should each person pay to divide the rent fairly?
- a) Lynn - \$4 b) Lynn - \$5 c) Lynn - \$6 d) Lynn - \$7 e) Lynn - \$8
Kim - \$10 Kim - \$9 Kim - \$8 Kim - \$7 Kim - \$6
14. National elections occur on the first Tuesday after the first Monday in November. What is the latest date possible in November for the elections?
- a) 2 b) 8 c) 12 d) 13 e) 14
15. A car has a list price of \$15,000. For which of the following payment options will the least amount of money be paid for the car?
- a) 15% discount
b) \$1000 down payment and 60 monthly payments of \$200
c) 5% discount and then a 10% discount
d) \$2100 discount
e) \$3000 down payment and 36 monthly payments of \$300

16. Consider the operation \bullet as defined by the following table.

\bullet	1	2	3	4
1	1	2	3	4
2	2	4	1	3
3	3	1	4	2
4	4	3	2	1

For example, $3 \bullet 2 = 1$. Find $(2 \bullet 4) \bullet (1 \bullet 3)$.

- a) 1 b) 2 c) 3 d) 4 e) 5

17. What is the median of the following distances: 8 cm, 5200 mm, 245 cm, 91 mm, 6 m

- a) 8 cm b) 5200 mm c) 245 cm d) 91mm e) 6m

18. In Sunnyside, $\frac{1}{6}$ of the downtown workers drive a car to work. Of those who do not drive, $\frac{1}{10}$ ride bicycles to work. What fraction of all the workers ride bicycles to work?

- a) $\frac{1}{20}$ b) $\frac{1}{15}$ c) $\frac{1}{12}$ d) $\frac{1}{4}$ e) $\frac{4}{15}$

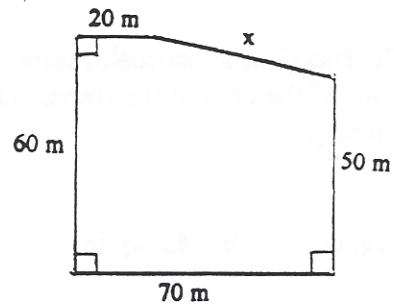
19. A day-care service makes a profit of \$700 per week. What are the operator's weekly costs if the profit is 17.5% of his weekly income?

- a) \$3500 b) \$3300 c) \$3100 d) \$2900 e) \$2700

20. What is the 101st digit in the decimal representation of $\frac{26}{111}$?

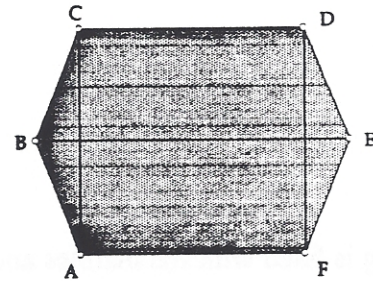
- a) 1 b) 2 c) 3 d) 4 e) 5

26. The length of side x in the figure is



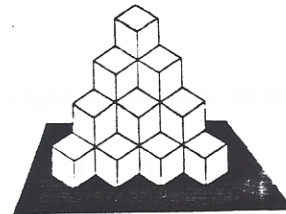
- a) $\sqrt{2400}$ m b) $\sqrt{2500}$ m c) $\sqrt{2600}$ m d) $\sqrt{2800}$ m e) $\sqrt{2900}$ m

27. What is the area of the shaded region below? Quadrilateral $ABEF \cong$ quadrilateral $CBED$. Both are isosceles trapezoids. $BE = 14$ $DF = 10$ $AF = 10$



- a) 110 sq. in. b) 115 sq. in. c) 120 sq. in. d) 125 sq. in. e) 140 sq. in.

28. What is the ratio of the number of cubes that touch the floor to the number of cubes that do not touch the floor in the stack of cubes pictured below?



- a) $\frac{1}{1}$ b) $\frac{1}{2}$ c) $\frac{2}{1}$ d) $\frac{3}{5}$ e) $\frac{5}{3}$

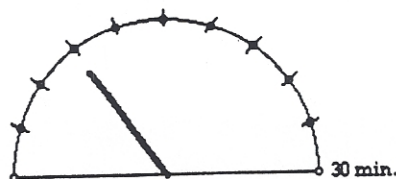
29. Which is the best estimate for the following problem?

$$2.4396 + \frac{13}{24} \times \frac{41}{20}$$

- a) 2.5 b) 3.5 c) 4 d) 5 e) 10

30. How much time is left on the parking meter pictured below?

- a) 8 minutes b) 9 minutes
c) 10 minutes d) 12 minutes
e) 15 minutes



31. Two "corners" of an isosceles trapezoid are cut off leaving a regular hexagon. If the area of the trapezoid is 48 sq. in., what is the area of the hexagon?



- a) 45 sq. in. b) 42 sq. in. c) 36 sq. in. d) 30 sq. in. e) 24 sq. in.
32. A movie theater has 42 people seated in it. If $\frac{3}{5}$ of the seats are empty, how many total seats are in the theater?
- a) 21 b) 63 c) 84 d) 105 e) 124
33. A bag is filled with red marbles and black marbles. The ratio of red marbles to black marbles is 5 to 7. If there are 180 marbles in the bag, how many are red?
- a) 80 b) 85 c) 75 d) 70 e) 72
34. $\triangle ABC$ is an isosceles triangle. The measure of $\angle A$ is 96° . What is the measurement of $\angle C$?
- a) 42° b) 84° c) 96° d) 60° e) not enough information to answer question
35. Give the next number in the sequence: 2, 6, 15, 31, 56, ...
- a) 60 b) 92 c) 71 d) 75 e) 80
36. Which of the following is equal to $2^{300} \cdot 3^{300}$.
- a) 6^{600} b) 5^{600} c) 5^{300} d) 6^{300} e) 6^{900}

37. The coordinates of the center of a circle are $(\frac{1}{2}, 0)$. One endpoint of a diameter is $(5, -3)$. What are the coordinates of the other endpoint?

- a) $(-4, -3)$ b) $(4, -3)$ c) $(-3, 3)$ d) $(4, 3)$ e) $(-4, 3)$

38. Place the following in descending order.

$\frac{1}{2}, 0.45, 1, \frac{7}{13}, \frac{3}{5}, 0.7$

- a) $1, 0.7, \frac{7}{13}, \frac{3}{5}, \frac{1}{2}, 0.45$
b) $1, \frac{7}{13}, 0.45, \frac{3}{5}, 0.7, \frac{1}{2}$
c) $1, \frac{3}{5}, 0.45, \frac{1}{2}, 0.7, \frac{7}{13}$
d) $1, \frac{1}{2}, 0.45, \frac{7}{13}, 0.7, \frac{3}{5}$
e) $1, 0.7, \frac{3}{5}, \frac{7}{13}, \frac{1}{2}, 0.45$

39. There are 86 eighth grade students. Thirty six of the eighth-graders take neither Spanish nor band. Twelve eighth-graders take both Spanish and band. A total of 40 eighth-graders are in band. How many eighth-graders take Spanish but not band?

- a) 8 b) 24 c) 22 d) 12 e) 10

40. Two red tiles and one blue tile are in a bag. Ann draws one without looking. Then, without looking, Bill draws one of the two that are left in the bag. If the tiles drawn match, Ann wins. If they don't match, Bill wins. What is the probability Ann will win?

- a) $\frac{1}{2}$ b) $\frac{2}{3}$ c) $\frac{1}{6}$ d) $\frac{1}{3}$ e) $\frac{5}{6}$

The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system of equations...

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