

# 1999 SIXTH GRADE MATHEMATICS COMPETITION

AUSTIN PEAY STATE UNIVERSITY  
CLARKSVILLE, TENNESSEE

MIDDLE TENNESSEE STATE UNIVERSITY  
MURFREESBORO, TENNESSEE

UNIVERSITY OF TENNESSEE AT MARTIN  
MARTIN, TENNESSEE

Scoring Formula:  $4R - W + 40$

## DIRECTIONS:

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

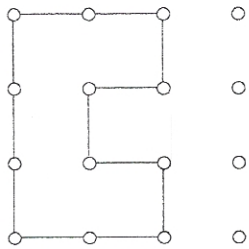
	A	B	C	D	E
1	①	②	③	●	⑤
	A	B	C	D	E
2	①	②	③	④	⑤
	A	B	C	D	E
3	①	②	③	④	⑤

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.

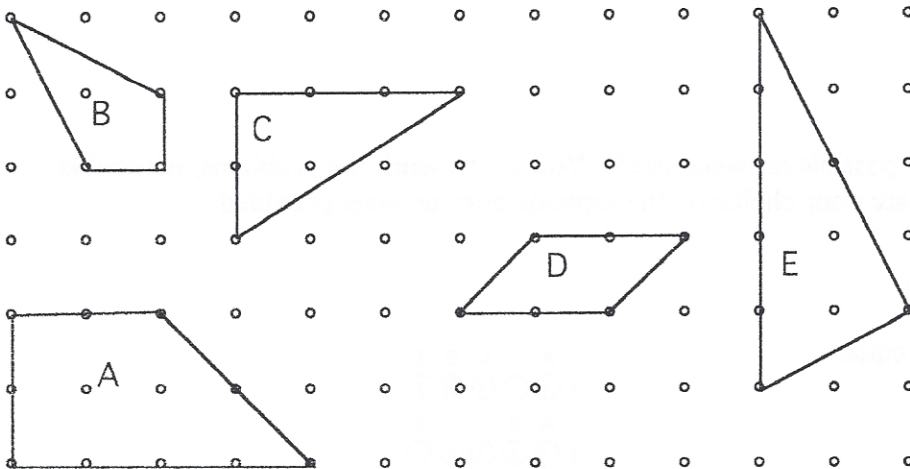
When told to do so, open your test booklet and begin. When you have finished one page, go on to the next. The working time for the entire test is 60 minutes.

1. If the distance between two consecutive dots in a row is 1 unit, what is the area of the figure shown here?



- (a) 5 square units
- (b) 12 units
- (c) 12 square units
- (d) 6 square units
- (e) 10 units

2. Which of the figures has a line of symmetry?



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

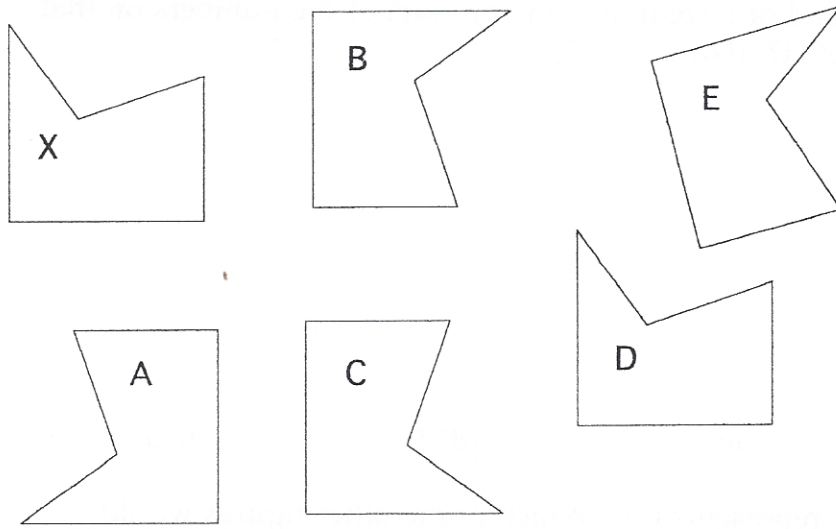
3. Which of the following statements is true?

- (a) A liter is more than a gallon.
- (b) A liter is less than a cup.
- (c) A milliliter is one thousandth of a liter.
- (d) A milliliter is about a quart.
- (e) A milliliter is more than a liter.

4. \$12 is what percent of \$4,800?

- (a) 25%
- (b) 2.5%
- (c) 0.25%
- (d) 40%
- (e) 4%

5. Which of the figures shown here is a reflection (flip) of Figure X?



(a) Figure A    (b) Figure B    (c) Figure C    (d) Figure D    (e) Figure E

6. Which of these has the least quotient?

- (a)  $0.01 \div 2$
- (b)  $0.1 \div 0.2$
- (c)  $0.01 \div 0.02$
- (d)  $0.01 \div 20$
- (e)  $0.01 \div 0.002$

7. Which of these has the greatest product?

- (a)  $0.01 \times 0.2$
- (b)  $0.1 \times 0.2$
- (c)  $0.01 \times 0.002$
- (d)  $0.0100 \times 0.20$
- (e)  $0.010 \times 0.002$

8. What is the average speed (in miles per hour) of a car that travels 87 miles in 90 minutes?

- (a) 29 mph    (b) 58 mph    (c) 65 mph    (d) 87 mph    (e) 96 mph

9. Josh and Shane ordered a large pizza that had been cut into equal-sized slices. Josh ate half the pizza. Shane ate one fourth of the pizza. Together they ate 12 slices. How many slices were there to begin with?

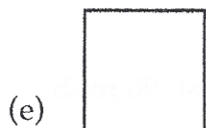
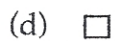
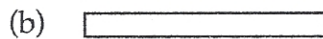
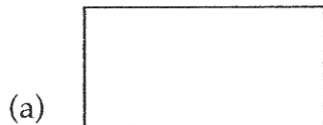
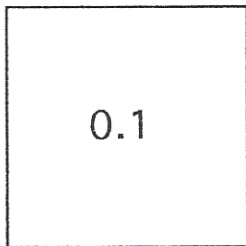
- (a) 12 slices    (b) 16 slices    (c) 20 slices    (d) 24 slices    (e) 48 slices

10. In the number puzzle shown below, each letter stands for a different number between 1 and 9. The number at the end of a row is the product of the numbers on that row. The number at the end of a column is the product of the numbers on that column. What is the value of H? (Hint:  $D = 1$ )

A	B	C	60
D	E	F	21
G	H	J	288
48	60	126	

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

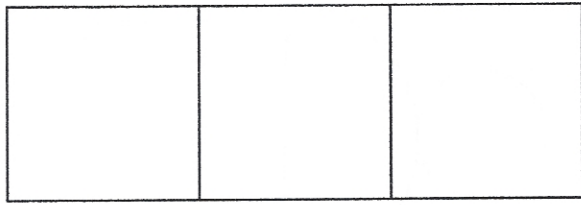
11. The square shown below represents 0.1. Which of the other figures would represent 0.01?



12. At 225 miles per hour, how long would it take a race car to complete a  $2\frac{1}{4}$  mile lap at the race track?

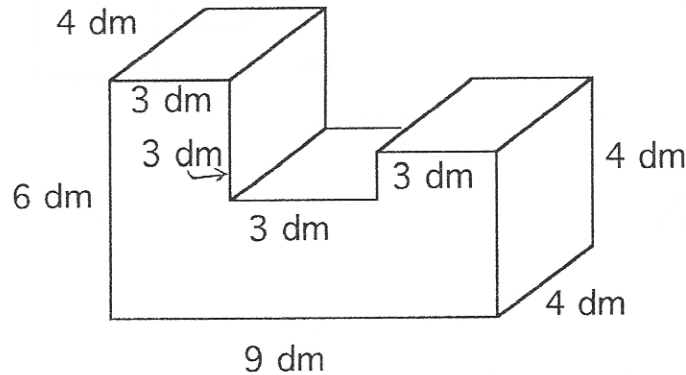
- (a) 36 seconds    (b) 37 seconds    (c) 40 seconds    (d) 42 seconds    (e) 50 seconds

13. The large rectangle shown here is made up of three squares placed side-by-side. If the perimeter of the large rectangle is 96 centimeters, what is its area in square centimeters?



- (a) 32 sq. cm      (b) 144 sq. cm      (c) 432 sq. cm      (d) 1024 sq. cm      (e) 288 sq. cm

14. Find the volume of the solid shown here. (All angles are right angles. There are no gaps you cannot see.)



- (a) 93,312 cubic decimeters  
 (b) 216 cubic decimeters  
 (c) 156 cubic decimeters  
 (d) 144 cubic decimeters  
 (e) 39 cubic decimeters

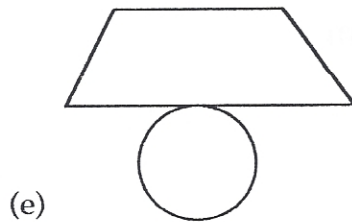
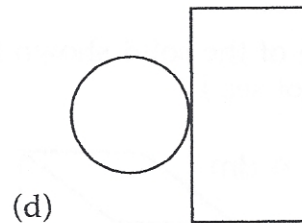
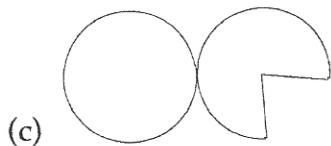
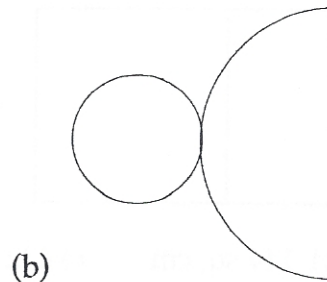
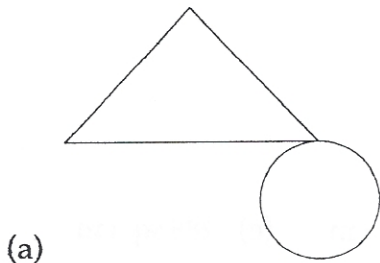
15. A ball and a book cost \$3.50. A book and a basket cost \$6.50. A basket and a ball cost \$6.00. How much does the ball cost?

- (a) \$1.00      (b) \$1.50      (c) \$2.00      (d) \$2.50      (e) \$3.00

16.  $1 + 2 + 3 + 4 + 5 = 15$ ;       $2 + 3 + 4 + 5 + 6 = 20$ ;       $3 + 4 + 5 + 6 + 7 = 25$ .  
 The sum of any 5 consecutive Natural Numbers is a multiple of 5. Which of the following numbers is the least of the five consecutive Natural Numbers whose sum is 1335?

- (a) 265      (b) 267      (c) 269      (d) 135      (e) 1035

17. Which of the following nets could be folded into a cone with no parts of the net overlapping each other? (In each case the complete circular region is the base of the cone.)



18. The decimal point on Lynn's calculator will not show on the display. When Lynn entered  $534.6 \times 0.545$ , the calculator displayed these digits: 2 9 1 3 5 7. Which of the numbers listed here shows the correct placement of the decimal point in the product  $534.6 \times 0.545$ ?

- (a) 2.91357
- (b) 29.1357
- (c) 291.357
- (d) 2913.57
- (e) 29135.7

19. Fifteen percent of the students in the sixth period gym class wear glasses. There are 17 students in the sixth period gym class who do not wear glasses. How many students are in the sixth period gym class?

- (a) 2.55
- (b) 20
- (c) 32
- (d) 70
- (e) 85

20. A manufacturer made 47 ounces of perfume. The company puts  $\frac{3}{8}$  ounce of perfume in each bottle. After filling as many bottles as possible, how many ounces of perfume will be left over?

- (a)  $\frac{1}{8}$  ounce
- (b)  $\frac{1}{4}$  ounce
- (c)  $\frac{1}{3}$  ounce
- (d)  $\frac{1}{5}$  ounce
- (e)  $\frac{1}{6}$  ounce

21. If the figure shown here represents  $\frac{6}{7}$ , which of the other figures would represent one half?



- (a) (b) (c) (d) (e)

22. There are twelve \$1-bills, nine \$5-bills, two \$10-bills, and one \$20 bill mixed up in a paper bag. You may reach in and choose one of them at random. What is the probability you get at least \$10?

- (a)  $\frac{1}{8}$
- (b)  $\frac{3}{10}$
- (c)  $\frac{1}{12}$
- (d)  $\frac{9}{50}$
- (e)  $\frac{1}{24}$

23. What is the best estimate for the length of the line segment drawn here?



- (a) 2 cm
- (b) 4 cm
- (c) 8 cm
- (d) 15 cm
- (e) 20 cm

24. The Fibonacci Sequence is a very famous pattern of numbers. This chart shows the first 6 Fibonacci numbers. Eight is the first Fibonacci number that is a multiple of 4. Eight is in the sixth position. In what position is the second Fibonacci number that is a multiple of four?

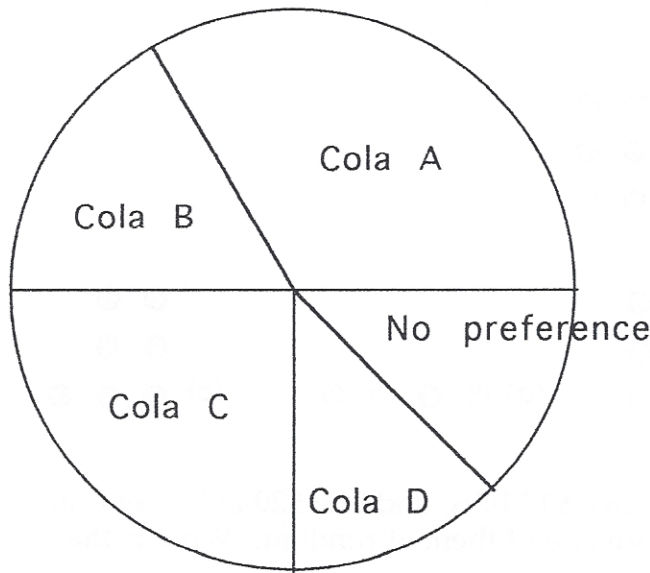
Position	1	2	3	4	5	6
Fibonacci number	1	1	2	3	5	8

- (a) 9      (b) 10      (c) 12      (d) 14      (e) 16

25. How many of the first 100 counting numbers are neither multiples of 4 nor multiples of five?

- (a) 40      (b) 45      (c) 55      (d) 60      (e) 95

26. The circle graph shown here represents the preferences of a group of 300 people for 4 different kinds of soft drinks. About how many people chose Cola B?



- (a) 50      (b) 75      (c) 100      (d) 120      (e) 150

27. Jason lost  $\frac{1}{3}$  of the pennies he had in his collection. Of the remaining pennies,  $\frac{1}{4}$  are dated 1990 or later. What fraction of the pennies he still has are dated earlier than 1990.

- (a)  $\frac{1}{12}$       (b)  $\frac{1}{6}$       (c)  $\frac{1}{3}$       (d)  $\frac{1}{2}$       (e)  $\frac{3}{4}$



28. A human being breathes approximately six quarts of air every minute. 14,625,000 people live in New York City. About how many gallons of air do New Yorkers breathe per minute?

- (a) 21,937,500 gal.
- (b) 9,750,000 gal.
- (c) 87,750,000 gal.
- (d) 58,500,000 gal.
- (e) 2,437,500 gal.

29. The distance from C to D is 48 miles. The distance from B to C is  $\frac{2}{3}$  the distance from C to D. The distance from A to B is  $\frac{3}{8}$  of the distance from B to C. What is the distance from A to B?

- (a) 4 miles
- (b) 12 miles
- (c) 18 miles
- (d) 24 miles
- (e) 32 miles

30. Adult tickets for a play cost \$5. Student tickets for the play cost \$4. The ratio of adult tickets to student tickets sold was 1:2. There were 600 tickets sold. What was the total value of the tickets sold?

- (a) \$5400
- (b) \$3000
- (c) \$2800
- (d) \$2700
- (e) \$2600

31. Lucy vacuums the rug every 18 days, washes clothes every 12 days, and pays bills every 15 days. Today she did all three. How long will it be before she does all three things on the same day again?

- (a) 90 days
- (b) 120 days
- (c) 180 days
- (d) 1080 days
- (e) 3240 days

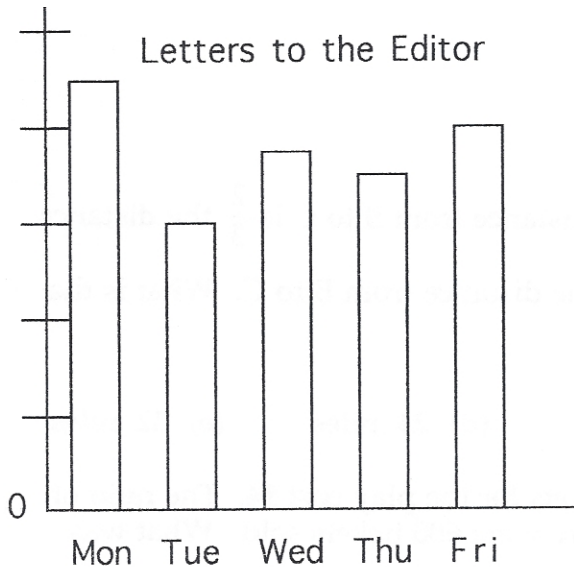
32. The personnel director of a company is recruiting employees. The company salaries are as follows:

Salary	\$90,000	\$70,000	\$50,000	\$40,000	\$30,000	\$20,000
No. of employees	1	1	3	10	20	5

What are the mean, median, and the mode of the salaries?

- (a) Mean: \$50,000      Median: \$45,000      Mode: none
- (b) Mean: \$50,000      Median: \$30,000      Mode: \$30,000
- (c) Mean: \$35,250      Median: \$45,000      Mode: \$30,000
- (d) Mean: \$35,250      Median: \$30,000      Mode: \$30,000
- (e) Mean: \$35,250      Median: \$45,000      Mode: none

33. A student decided to graph the number of letters to the editor a local newspaper received during five days last week. When he drew the graph, he forgot to label the vertical axis. The average number of letters per day was 15. Label the vertical axis for him. You may assume equal intervals; the labels begin with 0, as shown.



The marks (from bottom to top) should be labeled:

- (a) 1, 2, 3, 4, 5
- (b) 2, 4, 6, 8, 10
- (c) 3, 6, 9, 12, 15
- (d) 4, 8, 12, 16, 20
- (e) 5, 10, 15, 20, 25

34. Five people entered a ping-pong tournament. Each person played two games with every other player. How many games were played?

- (a) 10
- (b) 20
- (c) 25
- (d) 40
- (e) 50

35. Six students stand in a circle and toss a ball to each other. How many tosses are made if each student tosses the ball to every other student once? (For example, Jay tossing the ball to Lynn would be one toss, and Lynn tossing the ball to Jay would be another toss.)

- (a) 12
- (b) 15
- (c) 25
- (d) 30
- (e) 36

36. If four people can paint a house in 3 hours, how long would it take 6 people to paint the same house? (We will assume that everyone works the whole time at the same rate.)

- (a) 1.5 hours
- (b) 2 hours
- (c) 4.5 hours
- (d) 5 hours
- (e) 6 hours

37.  $4^1 = 4$ ;  $4^2 = 16$ ;  $4^3 = 64$ .  
What digit will be in the ones position of  $4^{1999}$ ?

- (a) 0                      (b) 2                      (c) 4                      (d) 6                      (e) 8

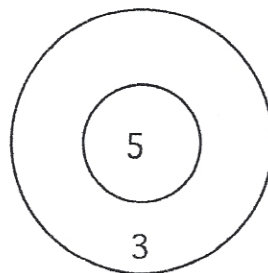
38. Cindy used a 25% off coupon to purchase a new coat for \$60 (not including sales tax). How much would the coat have cost (excluding tax) if she had not used the coupon?

- (a) \$65                      (b) \$70                      (c) \$75                      (d) \$80                      (e) \$85

39. It takes Chad 1 hour to mow the lawn. It takes Curt 45 minutes to mow half the lawn. Which statement is true?

- (a) It takes Chad the same length of time to mow the lawn as it takes Curt.  
(b) It takes Curt 15 minutes longer than Chad to mow the whole lawn.  
(c) It takes Chad 15 minutes longer than Curt to mow the whole lawn.  
(d) It takes Chad 30 minutes longer than Curt to mow the whole lawn.  
(e) It takes Curt 30 minutes longer than Chad to mow the whole lawn.

40. The score for this dartboard is the sum of the points made by each dart. For example, if 2 darts hit the 3 and 3 darts hit the 5, the total score would be 21. What is the highest score below 100 that is IMPOSSIBLE to score on the given dart board? (Assume you may throw as many darts as you would like.)



- (a) 23                      (b) 22                      (c) 14                      (d) 11                      (e) 7

