Name: _____ Date: _____ Score: _____

MATHEMATICS TEST
8 Minutes—8 Questions

DIRECTIONS: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note:Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word line indicates a straight line.
4. The word average indicates arithmetic mean.

Pre-Algebra 23% ~ about 14 out of 60

1. There are 280 runners registered for a race, and the runners are divided into 4 age categories, as shown in the table below.

Age category:	Under 16	16-25	26-35	Over 35
# of runners:	40	76	112	52

The prize committee has 60 prizes to award and wants the prizes to be awarded in proportion to the number of runners registered in each category. How many prizes should be designated for the 26–35 age category?
F. 15
G. 17
H. 24
J. 36
K. 40

2. Tom's long-distance service charges $0.10 per minute from 7:00 P.M. to 7:00 A.M. on weekdays, all day on Saturdays, and all day on holidays; $0.05 per minute all day on Sundays; and $0.25 per minute at all other times. The table below gives his long-distance calls for 1 week, including the date and day of each call, the time it was placed, and the number of minutes it lasted.

Date and day	Time	Number of minutes
11/22 Tuesday	5:00 P.M.	8
11/23 Wednesday	10.30 A.M.	10
11/24 Thursday Thanksgiving holiday	11:30 A.M.	15
11/26 Saturday	9:30 A.M.	17
11/27 Sunday	12:15 P.M.	22

What did Tom's long-distance service charge him for the calls in the table?
F. $7.30
G. $7.60
H. $7.95
J. $8.80
K. $9.90

3. What is the median of the following 7 scores?
42, 67, 33, 79, 33, 89, 21

A. 42
B. 52
C. 54.5
D. 56
E. 79

Elementary Algebra 17% ~ about 10 out of 60

4. For all x, $(3x + 7)^2 = ?$

A. $6x + 14$ **B.** $6x^2 + 14$ **C.** $9x^2 + 49$ **D.** $9x^2 + 21x + 49$ **E.** $9x^2 + 42x + 49$

Intermediate Algebra 15% ~ about 9 out of 60

5. For a population that grows at a constant rate of r% per year, the formula $P(t) = p_o\left(1 + \frac{r}{100}\right)^t$ models the population t years after an initial population of p_o people is counted. The population of the city of San Jose was 782,000 in 1990. Assume the population grows at a constant rate of 5% per year. According to this formula, which of the following is an expression for the population of San Jose in the year 2000 ?

A. $782{,}000(6)^{10}$
B. $782{,}000(1.5)^{10}$
C. $782{,}000(1.05)^{10}$
D. $(782{,}000 \cdot 1.5)^{10}$
E. $(782{,}000 \cdot 1.05)^{10}$

Coordinate Geometry 15% ~ about 9 out of 60

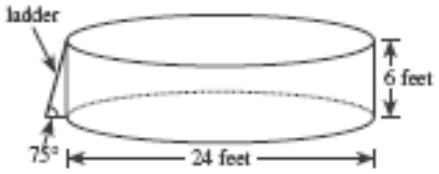
6. In the standard (x,y) coordinate plane, the midpoint of $\overline{AB}$ is (4,–3) and A is located at (1,–5). If (x,y) are the coordinates of B, what is the value of $x + y$?

A. 19
B. 8
C. 6
D. –1.5
E. –3

Plane Geometry 23% ~ about 14 out of 60

Use the following information to answer questions 7 and 8.

The youth center has installed a swimming pool on level ground. The pool is a right circular cylinder with a diameter of 24 feet and a height of 6 feet. A diagram of the pool and its entry ladder is shown below.



7. To the nearest cubic foot, what is the volume of water that will be in the pool when it is filled with water to a depth of 5 feet?

(Note: The volume of a cylinder is given by $\pi r^2 h$, where r is the radius and h is the height.)

A. 942
B. 1,885
C. 2,262
D. 9,047
E. 11,310

8. A plastic cover is made for the pool. The cover will rest on the top of the pool and will include a wedge-shaped flap that forms a 45° angle at the center of the cover, as shown in the figure below. A zipper will go along 1 side of the wedge-shaped flap and around the arc. Which of the following is closest to the length, in feet, of the zipper?

F. 17
G. 22
H. 24
J. 29
K. 57