Longitudinal Study of American Youth

MATHEMATICS
Form (Y)

Public Opinion Laboratory

Northern Illinois University   DeKalb, Illinois   60115

1.
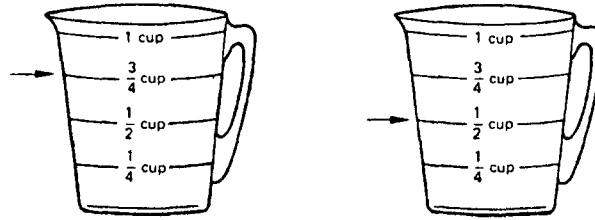
The measuring cup on the left is filled with water to the line marked with the arrow. The measuring cup on the right is filled with water to the line marked with the arrow. How much water is in both cups together?

(A) $^4/_6$ cups

(B) $^3/_8$ cups

(C) 2 cups

(D) $1^1/_4$ cups   N285201

2. It is approximately 90,000,000 miles from the Earth to the Sun. Which is the correct scientific notation for this distance?

(A) 9×10^7

(B) 9×10^8

(C) 90×10^5

(D) 90 million $\times 10^7$ N201101

3. The picture shows a chocolate cake.

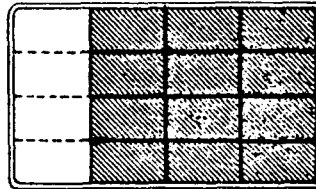Joan and Joe told their mother that part of the chocolate cake had disappeared. Joan said, "Look, $\dfrac{4}{16}$ of the cake has disappeared!" Joe said, "No, only $\dfrac{1}{4}$ of the cake is gone." Which of the following is true?

(A) Joan is correct and Joe is wrong.

(B) Joe is correct and Joan is wrong.

(C) Both Joan and Joe are right.

(D) Both Joan and Joe are wrong.   N201801

4. A cooking instructor estimates that he uses 6 dozen eggs each month. At that rate about how many eggs does he use in one year?

(A) 70

(B) 800

(C) 1,200

(D) 2,500   N206701

5.

TRAFFIC VOLUME SURVEY	
Time Period	Tally
9:00 – 9:15	〲〲 〲〲 ////
9:15 – 9:30	〲〲 〲〲 ////
9:30 – 9:45	〲〲 /
9:45 –10:00	////
12:00 –12:15	〲〲 〲〲 〲〲
12:15 –12:30	〲〲 〲〲 ////
12:30 –12:45	〲〲 〲〲
3:00 – 3:15	〲〲 〲〲 ////

The chart above shows the number of cars passing a certain highway marker in a given period of time. What is the total number of cars passing the marker from 12:00 to 12:45?
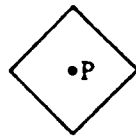
(A) 10

(B) 15

(C) 29

(D) 39   N224401

6. If $7x + 4 = 5x + 8$, then $x =$

(A) 1

(B) 2
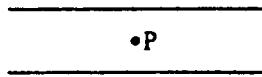
(C) 4

(D) 6   N210601
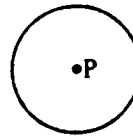
7. Which of these figures has all of its points the same distance from point P?

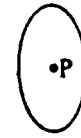

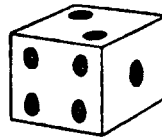(A)   (B)   (C)   (D)   N213001

8.

Scott rolls a number cube with 1, 2, 3, 4, 5, and 6 dots on its faces. What is the probability of Scott NOT getting a 4 on this roll?

(A) 0   (B) $\frac{1}{6}$ (C) $\frac{2}{6}$ (D) $\frac{3}{6}$ (E) $\frac{4}{6}$ (F) $\frac{5}{6}$ N262802

9. In $\triangle$ ABC, AB = BC. Which of the following must be true?

(A) $m\angle A + m\angle C = 90°$ (C) $m\angle A > m\angle B$

(B) $m\angle A = m\angle C$ (D) $m\angle C < m\angle B$ N213501
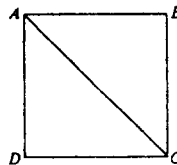
10. A plumber charges customers $18 for each hour worked plus an additional $9 for travel. If C represents the total charge and h the number of hours worked, which formula could be used to calculate the plumber's total charge in dollars?

(A) $C = 18 + 9 + h$ (C) $C = 18 \times 9 + h$ (E) $C = 18 \times 9 \times h$

(B) $C = 18 + 9 \times h$ (D) $C = 18 \times h + 9$ N255101

11.

The area of square ABCD is 100 square centimeters. Which is true of the length of diagonal AC?

(A) It is equal to 10 centimeters.   (C) It is less than 10 centimeters.

(B) It is greater than 10 centimeters.   (D) It cannot be determined from the information given.   N226201

12.

Side   Top
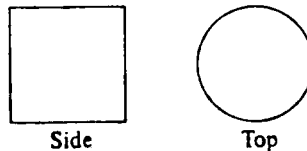
A geometry solid is viewed from the side and from the top. Those views are shown above. What could the solid be?

(A) Cone   (B) Cylinder   (C) Sphere   (D) Cube   N212701

13. Which of the patterns can be folded along the dotted lines to form an open box in the shape of a cube with a bottom but no top?

I   II   III
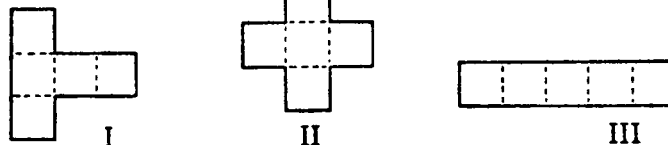
(A) II only   (C) I and III only

(B) I and II only   (D) I, II, and III   N232001

14.

For the figure above, which of the following must be true?

I. r = t   II. s = u   III. s + t = 180

(A) I only   (C) I and II only
(B) III only   (D) I, II, and III   N213601
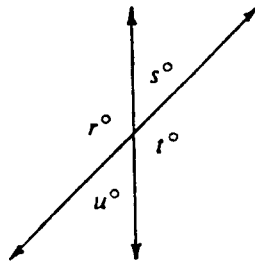
15. Which of the following sentences is true when any number is substituted for x?

(A) x + 1 = x   (C) x · 1 = 1
(B) x + 0 = 0   (D) x · 1 = x   N264701

16. If a fair coin is tossed, the probability that it will land heads up is $\frac{1}{2}$. In four successive tosses the coin lands heads up each time. What happens when it is tossed a fifth time?

(A) It will most likely land tails up.
(B) It is more likely to land tails up than heads up.
(C) It is more likely to land heads up than tails up.
(D) It is equally likely to land heads up or tails up.   N222401

17. Larry says that $n^2 \geq n$ for all real numbers. Of the following, which value of n shows the statement to be FALSE?

(A) $-\frac{1}{2}$ (B) 0   (C) $\frac{1}{10}$ (D) 1   N220801

18. $\dfrac{^+10}{^-5} =$

(A) $^+2$ (B) $^-2$ (C) $^+5$ (D) $^{+}\frac{1}{2}$ (E) $^{-}\frac{1}{2}$ N286502

19. This is a picture of a block of wood.

If you looked straight down at the top of the block of wood shown above, what shape would you see?
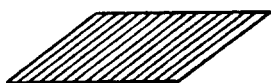
(A)   (B)   (C)   (D)   N215001

20. Jan has 3 dimes in her pocket and nothing else. If she takes 1 coin from her pocket, what is the probability that it will be a dime?

(A) $\frac{1}{10}$ (B) $\frac{3}{10}$ (C) $\frac{1}{3}$ (D) 1   N236101

21. Carlos' basketball team won 75% of its games last season. If they played 80 games, how many games did they win?

(A) 20   (C) 68

(B) 60   (D) 75   N259901
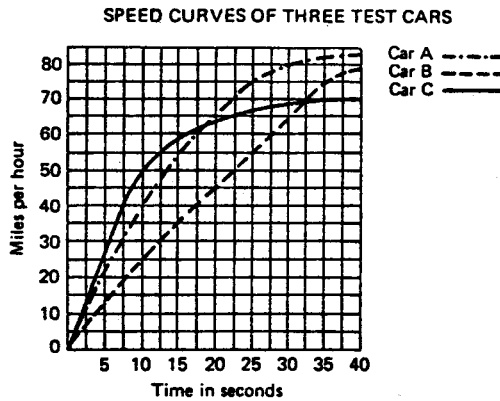
22. Change 75% to a common fraction.

(A) $^1/_{75}$ (C) $^5/_7$

(B) $^3/_4$ (D) $^7/_5$ N274802

23.

SPEED CURVES OF THREE TEST CARS

According to the graph above, which car reached 60 miles per hour in the shortest time?

(A) Car A   (B) Car B   (C) Car C   N263202

24. The temperature at noon was 10°. In the afternoon, the temperature dropped 4°. By midnight, the temperature dropped 14° more. What was the temperature at midnight?

(A) 28°   (B) 0°   (C) −8°   (D) −18°   N204701

25. What is the distance all the way around a rectangle that is 8 meters long and 5 meters wide?

(A) 13 meters (B) 26 meters (C) 40 meters (D) 80 meters N252001

26. If x is a real number, which one of the following is the graph of the solution set of $3x \geq 18$?

(A)

(B)

(C)

N271401
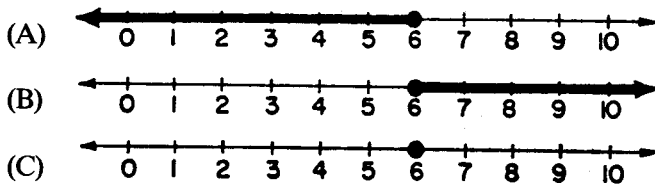
27. Hank, Jim, Roberto and Willie were on the same side in a baseball game. One of them hit a home run. From the following information, see if you can determine which one.

(1) The one who hit it plays shortstop and lives on Vine Street.

(2) Willie had to leave at the end of the 6th inning when the score was 2-0 in favor of the other side.

(3) Roberto pitched all innings of the game with no walks.

(4) After the game, Roberto and Jim went home together since they live next to each other on Cypress Street.

Which boy hit the home run?

(A) Hank   (B) Jim   (C) Roberto   (D) Willie   N262701

28.
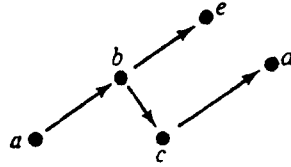
The letters in the diagram above represent numbers. If $\overset{\bullet}{x} \longrightarrow \overset{\bullet}{y}$ means x > y, which of the following is NOT necessarily true?

(A) b > d   (C) a > d

(B) e > d   (D) a > c   N220701

29. A theorem of geometry states that "the sum of the angles of a triangle is 180 degrees." This statement is called a theorem because

(A) it has been proved using the definitions and axioms of geometry.

(B) it has been demonstrated by measuring the angles of many triangles.

(C) it is true, but it cannot be proved.

(D) it is assumed true without proof.   N228701

30.

•Matt

•Ann

•P

•Raúl
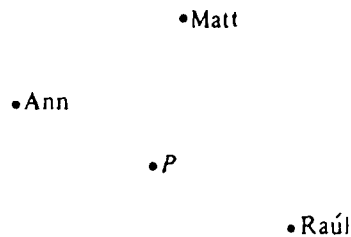
The teacher put a dot on the chalkboard and marked it P. Then she asked three children to measure 2 centimeters from P and put a dot. The picture shows where the children put their dots. If 20 children measured and each put a different dot, the picture would look most like a

(A) circle.   (C) square.

(B) rectangle.   (D) triangle.   N234901

31.

Table

West Wall

Stereo

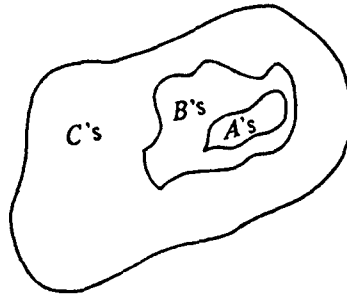Scale: ⊢—⊣ represents $1\frac{1}{2}$ feet
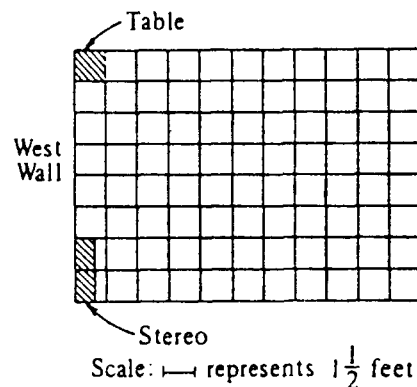
The scale drawing above shows the floor plan of a living room. A sofa is to be placed along the west wall between the table and the stereo. What is the maximum length the sofa can be?

(A) 5 feet   (C) 7½ feet

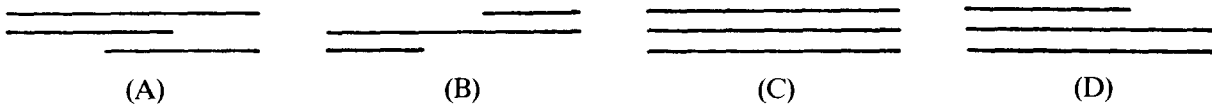(B) 6½ feet   (D) 8 feet   N232901

32.

Which two of the following may be concluded from the diagram above?

I.   All B's are A's
II. All A's are C's
III. Some B's are A's
IV. No B's are C's

(A) I and III only
(B) I and IV only
(C) II and III only
(D) II and IV only   N220401

33. Which set of line segments CANNOT make a triangle?

(A)   (B)   (C)   (D)   N253701

34. If $7(t - 5) = \Box - 35$, what is $\Box$?

(A) 2t   (C) 7t − 35
(B) 7t   (D) 30   N209401

35.

The jar shown above contains 2 black and 3 white marbles. Al picks one marble without looking. What is the probability that he picks a black marble?

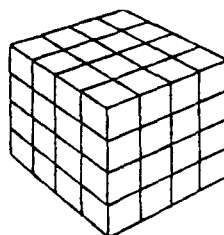(A) $\dfrac{1}{5}$ (B) $\dfrac{2}{5}$ (C) $\dfrac{2}{3}$ (D) 5   N221901

36. Which drawing below shows PERPENDICULAR LINES?

(A)   (B)   (C)   (D)   N254602

37.

A pile of cubes 1 inch by 1 inch by 1 inch are glued together to make the block pictured above. How many of the original small cubes are completely hidden <u>inside</u> the big block?

(A) 8   (C) 16
(B) 9   (D) 27   N215101

38. Dawn has 3 skirts and 5 blouses. How many different skirt-blouse outfits can she make with these?

(A) 3   (C) 8
(B) 5   (D) 15   N223301

39. The area of a rectangle is 24, and the measures of its length and width are whole numbers. Which of the following are NOT possible dimensions for the rectangle?

(A) L = 8, W = 3   (C) L = 6, W = 4
(B) L = 12, W = 12   (D) L = 24, W = 1   N218501

40. Allen's batting average is 0.425. What is his batting average as a percent?

(A) 0.0425%   (C) 42.5%
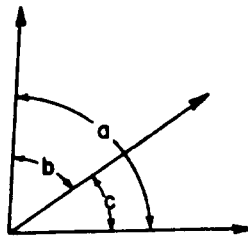(B) 4.25%   (D) 425%   N202501

41. If $V = \dfrac{6a^2b^3}{5}$, what is the value of V when a = 1 and b = 2?

(A) $\dfrac{288}{5}$ (B) $\dfrac{216}{5}$ (C) $\dfrac{72}{5}$ (D) $\dfrac{48}{5}$ N210401

42.

If angle a measures 85° and angle b measures 52°, what does angle c measure?

(A) 33°   (C) 137°
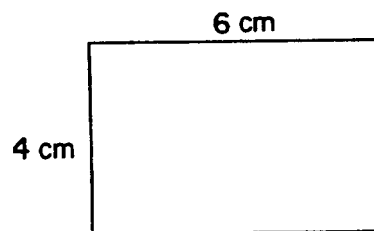(B) 38°   (D) Not enough information given   N254301

43. What can be said about the sum of two even numbers?

(A) It is always an odd number.
(B) It is always an even number.
(C) It is always a prime number.
(D) It is sometimes an even number and sometimes an odd number.   N282202

44.

What is the area of this rectangle?

(A) 4 square cm   (C) 10 square cm   (E) 24 square cm
(B) 6 square cm   (D) 20 square cm   N269001

45. Here are the ages of five children:
        13, 8, 6, 4, 4
What is the average age of these children?

(A) 4   (C) 7   (E) 9
(B) 6   (D) 8   (F) 13   N263501

46. In a pet shop there are 12 animals. Seven are dogs and the rest are cats. What is the ratio of dogs to cats?

(A) 12:7   (C) 7:12
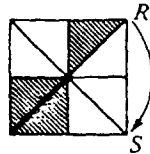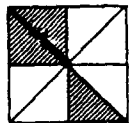(B) 5:7   (D) 7:5   N208101

47. SIMPLIFY. $3 - 5(4 - x)$

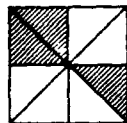(A) $-8 + 2x$ (C) $-17 + 5x$
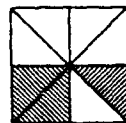(B) $-8 - 2x$ (D) $-17 - 5x$ N270702

48.

If you turn the square figure shown above about its center so that the corner labeled R ends up at S, which diagram shows what the figure will look like?
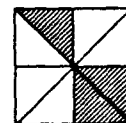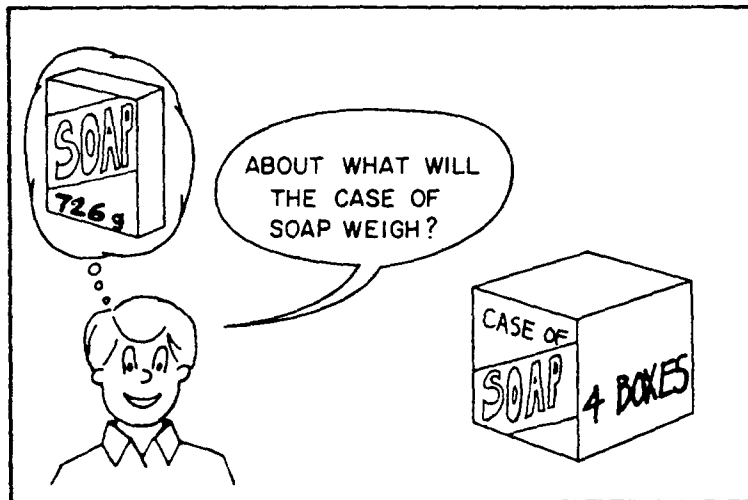
(A)   (B)   (C)   (D)   N226401

49. ESTIMATE.

(A) 2800 g   (C) 3200 g
(B) 2900 g   (D) 28,000 g   N261201

50. It took 3 games for a basketball player to score a total of 51 points. If the player keeps this scoring average, how many total points will the player have scored by the end of the seventh game?

(A) 17   (C) 119   (E) 170
(B) 51   (D) 153   (F) 357   N263901

51. SIMPLIFY. $4(1 + 6y) + 15$

(A) $24y + 19$ (C) $6y + 19$
(B) $28y + 15$ (D) $24y + 64$ N270701

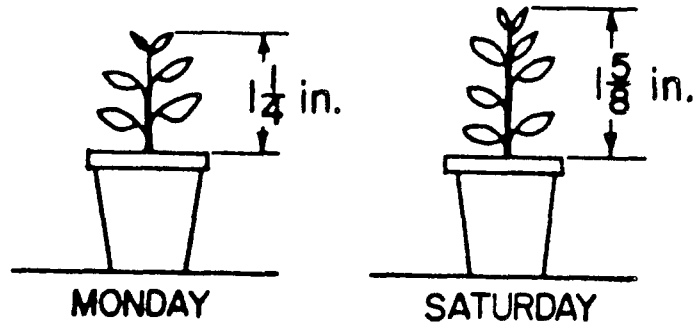**52.** If you add the page numbers for two facing pages in a book, the sum is 89. What is one of the page numbers?

(A) 40   (C) 89
(B) 44   (D) Any of the above   N203201

53.

Which one of the following expressions represents how many inches this plant grew from Monday to Saturday?

(A) $1\frac{1}{4} + 1\frac{5}{8}$ (B) $1\frac{5}{8}$ (C) $1\frac{5}{8} - 1\frac{1}{4}$ (D) $1\frac{1}{4} - 1\frac{5}{8}$ N258901

54. Which of the following are equivalent equations?
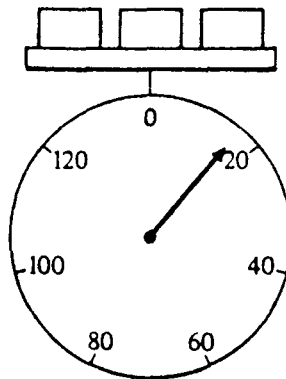
(A) $x + 2 = 9$ and $x - 2 = 9$ (C) $z - 6 = 3$ and $z = 3$
(B) $y - 3 = 7$ and $y + 5 = 15$ (D) $1 + 2 = w$ and $w + 1 = 2$ N209301

55.

Each of the three blocks in the figure above weighs the same. The weight of each block is closest to how many units?

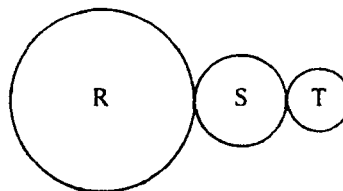(A) 3   (B) 6   (C) 9   (D) 20   N219001

56.

The three gears above are connected so that S rotates 2 times and T rotates 3 times for each complete rotation of R. When S makes 10 rotations, how many rotations are made by T?

(A) $3\frac{1}{3}$ (B) $6\frac{2}{3}$ (C) 11   (D) 15   N233402

57. $\dfrac{^-15}{^-5} =$

    (A) $^+3$ (B) $^-3$ (C) $^-5$ (D) $^+5$ (E) $^-20$ N286501

58.

MUSICAL FAVORITES	
SINGERS	NUMBER OF VOTES
Michael Jackson	20
Diana Ross	10
Julio Iglesias	10
Willie Nelson	5
Culture Club	5

According to the chart above, what percent of all votes went to Michael Jackson?

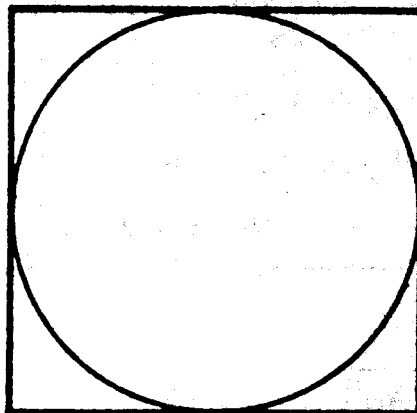   (A) 20%   (B) 40%   (C) 50%   (D) $66^2/_3$%   N204401

59. If x is less than 9, which one of the following MUST be true about x + 5?

    (A) It is less than 4.   (C) It is less than 14.
    (B) It is less than 5.   (D) It is greater than 5.   N255302

60.

The length of a side of this square is 6. What is the radius of the circle?

    (A) 2   (C) 4   (E) 8
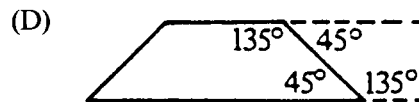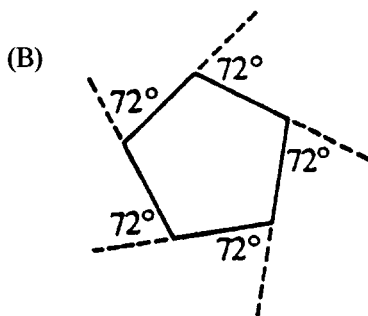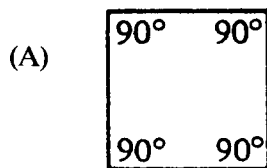   (B) 3   (D) 6   (F) 9   N251701

61. On the average, a baby's head is one-fourth the total length of the baby. If a baby's head is 10 centimeters long, about how long is the baby?

(A) 2.5 cm

(B) 14 cm

(C) 24 cm

(D) 40 cm   N207801

62. In geometry it is proved that the sum of the exterior angles of a polygon is 360°. Which figure shows that relationship?

N214101

ABOUT THIS TEST

Please answer the following questions after you have completed this test. Record your answers in the box at the end of the answer sheet.

A. How much of the material covered on this test has been taught in your classes?

B. How difficult was this test for you?

C. How well do you think you did on this test?

D. How hard did you work to do well on this test?

WHEN YOU HAVE FINISHED

Please check to make sure you have marked *one* answer for each question. When you have checked your answers, place your *Answer Sheet* inside the front cover of the test booklet. All of the booklets will be collected at the same time after everyone is finished. Please sit quietly while others are completing their work.

LONGITUDINAL STUDY OF AMERICAN YOUTH
MATH TEST   (FORM Y)

Student's Name

Today's Date

CORRECT MARK
Ⓐ Ⓑ Ⓒ ● Ⓔ

INCORRECT MARKS
⊗ ⊙ ⊘ ⊖ ⊂⊃

- Use black lead No. 2 pencil.
- Make heavy marks the full length of the boxes.
- Make only one mark per question.
- Erase cleanly any unintended marks.

PAGE 1

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

PAGE 2

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ABOUT THIS TEST

A. How much of the material on this test has been taught in your classes?

All	Almost All	Most	Some	Little
◯	◯	◯	◯	◯

B. How difficult was this test?

Very Difficult	Difficult	Easy	Very Easy
◯	◯	◯	◯

C. How well do you think you did?

Very Well	Well	Poorly	Very Poorly
◯	◯	◯	◯

D. How hard did you work?

Very Hard	Pretty Hard	Not Very Hard	Not Hard At All
◯	◯	◯	◯