

MATHEMATICS A

Thursday, June 14, 2007 — 1:15 to 4:15 p.m., only

Print Your Name:

Print Your School's Name:

Print your name and the name of your school in the boxes above. Then turn to the last page of this booklet, which is the answer sheet for Part I. Fold the last page along the perforations and, slowly and carefully, tear off the answer sheet. Then fill in the heading of your answer sheet.

Scrap paper is not permitted for any part of this examination, but you may use the blank spaces in this booklet as scrap paper. A perforated sheet of scrap graph paper is provided at the end of this booklet for any question for which graphing may be helpful but is not required. You may remove this sheet from this booklet. Any work done on this sheet of scrap graph paper will *not* be scored. All work should be written in pen, except graphs and drawings, which should be done in pencil.

This examination has four parts, with a total of 39 questions. You must answer all questions in this examination. Write your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in Parts II, III, and IV directly in this booklet. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc.

When you have completed the examination, you must sign the statement printed at the end of the answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.

Notice . . .

A minimum of a scientific calculator, a straightedge (ruler), and a compass must be available for you to use while taking this examination.

The use of any communications device is strictly prohibited when taking this examination. If you use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer all questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the separate answer sheet the numeral preceding the word or expression that best completes the statement or answers the question. [60]

Use this space for
computations.

1 Which letter has both point and line symmetry?

- (1) **Z** (3) **C**
(2) **T** (4) **H**

2 What is the value of x in the equation $6(x - 2) = 36 - 10x$?

- (1) -6 (3) 3
(2) 1.5 (4) 6

3 In his first three years coaching baseball at High Ridge High School, Coach Batty's team won 7 games the first year, 16 games the second year, and 4 games the third year. How many games does the team need to win in the fourth year so that the coach's average will be 10 wins per year?

- (1) 13 (3) 3
(2) 10 (4) 9

4 What is the value of w in the equation $\frac{1}{2}w + 7 = 2w - 2$?

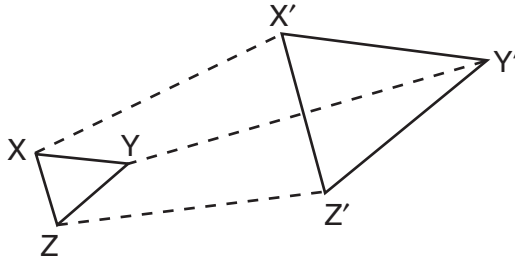
- (1) 6 (3) $3\frac{1}{3}$
(2) 2 (4) 3.6

5 A six-sided number cube has faces with the numbers 1 through 6 marked on it. What is the probability that a number less than 3 will occur on one toss of the number cube?

- (1) $\frac{1}{6}$ (3) $\frac{3}{6}$
(2) $\frac{2}{6}$ (4) $\frac{4}{6}$

Use this space for
computations.

- 11 The accompanying diagram shows the transformation of $\triangle XYZ$ to $\triangle X'Y'Z'$.

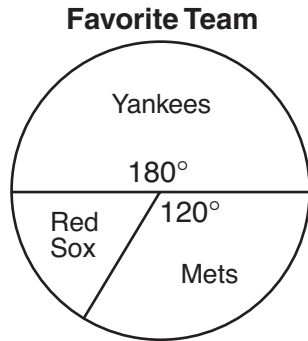


This transformation is an example of a

- (1) line reflection (3) translation
(2) rotation (4) dilation
- 12 When a fair coin was tossed ten times, it landed heads up the first seven times. What is the probability that on the eighth toss the coin will land with tails up?
- (1) $\frac{3}{10}$ (3) $\frac{7}{10}$
(2) $\frac{1}{2}$ (4) $\frac{3}{7}$
- 13 If the base of a triangle is represented by $x + 4$ and the height is represented by $2x$, which expression represents the area of the triangle?
- (1) $(x + 4) + (2x)$ (3) $\frac{1}{2}((x + 4) + (2x))$
(2) $(x + 4)(2x)$ (4) $\frac{1}{2}(x + 4)(2x)$
- 14 Which property is illustrated by the equation $\frac{3}{2}x + 0 = \frac{3}{2}x$?
- (1) commutative property of addition
(2) distributive property
(3) additive inverse property
(4) additive identity property

Use this space for computations.

- 15** In a recent poll in Syracuse, New York, 3,000 people were asked to pick their favorite baseball team. The accompanying circle graph shows the results of that poll.



How many of the people polled picked the Red Sox as their favorite team?

- (1) 300 (3) 1,200
(2) 500 (4) 1,800
- 16** Which ordered pair satisfies the system of equations below?

$$3x - y = 8$$

$$x + y = 2$$

- (1) (3,-1) (3) (2.5,0.5)
(2) (2.5,-0.5) (4) (5,-3)
- 17** What is the converse of the statement “If the Sun rises in the east, then it sets in the west”?
- (1) If the Sun does not set in the west, then it does not rise in the east.
(2) If the Sun does not rise in the east, then it does not set in the west.
(3) If the Sun sets in the west, then it rises in the east.
(4) If the Sun rises in the west, then it sets in the east.

**Use this space for
computations.**

22 Which statement describes the lines whose equations are $y = \frac{1}{3}x + 12$ and $6y = 2x + 6$?

- (1) They are segments.
- (2) They are perpendicular to each other.
- (3) They intersect each other.
- (4) They are parallel to each other.

23 What is the total number of different four-letter arrangements that can be formed from the letters in the word "VERTICAL," if each letter is used only once in an arrangement?

- (1) 8
- (2) 1,680
- (3) 6,720
- (4) 40,320

24 The expression $\sqrt{28} + \sqrt{63}$ is equivalent to

- (1) $\sqrt{91}$
- (2) $5\sqrt{7}$
- (3) $6\sqrt{7}$
- (4) $13\sqrt{7}$

25 The solution set of the equation $x^2 - 4x - 12 = 0$ is

- (1) $\{-6,2\}$
- (2) $\{-4,3\}$
- (3) $\{-2,6\}$
- (4) $\{-3,4\}$

26 If $a = 3$ and $b = -1$, what is the value of $ab - b^2$?

- (1) -2
- (2) 2
- (3) -4
- (4) 4

Use this space for
computations.

27 What is the sum of $\frac{3}{7n}$ and $\frac{7}{3n}$?

(1) $\frac{1}{n}$

(3) $\frac{42}{21n}$

(2) $\frac{10}{21n}$

(4) $\frac{58}{21n}$

28 Max goes through the cafeteria line and counts seven different meals and three different desserts that he can choose. Which expression can be used to determine how many different ways Max can choose a meal and a dessert?

(1) $7 \cdot 3$

(3) 7C_3

(2) $7! \cdot 3!$

(4) 7P_3

29 If the product of x and $\frac{1}{m}$ is -1 , $m \neq 0$, then x is equivalent to

(1) m

(3) $1 - m$

(2) $-m$

(4) $-\frac{1}{m}$

30 Given the statement: "A right angle measures 90° ." How is this statement written as a biconditional?

(1) If an angle is a right angle, then it measures 90° .

(2) An angle is a right angle if, and only if, it measures 90° .

(3) An angle measures 90° and it is a right angle.

(4) If an angle does not measure 90° , then it is not a right angle.

Part II

Answer all questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [10]

31 If a United States dollar is worth \$1.41 in Canadian money, how much is \$100 in Canadian money worth in United States money, to the nearest cent?

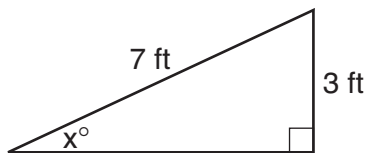
32 José surveyed 20 of his friends to find out what equipment they use to play recorded movies. He found that 12 of his friends have only DVD players, 5 have both DVD players and VCRs, and 2 have neither type of player. The rest of his friends have only VCRs. What is the total number of his friends that have VCRs?

33 The perimeter of an isosceles triangle is 71 centimeters. The measure of one of the sides is 22 centimeters. What are all the possible measures of the other two sides?

34 Using a compass and straightedge, construct the perpendicular bisector of \overline{AB} shown below. Show all construction marks.



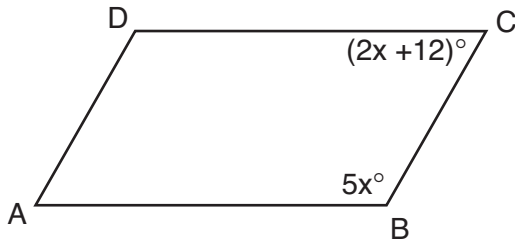
- 35** Ron and Francine are building a ramp for performing skateboard stunts, as shown in the accompanying diagram. The ramp is 7 feet long and 3 feet high. What is the measure of the angle, x , that the ramp makes with the ground, to the *nearest tenth of a degree*?



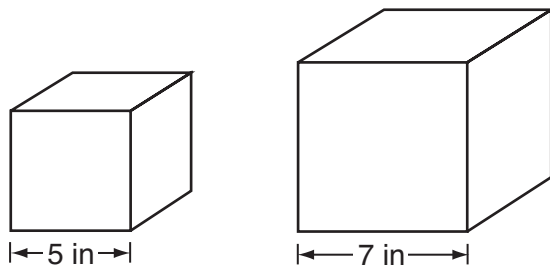
Part III

Answer all questions in this part. Each correct answer will receive 3 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [6]

- 36 In the accompanying diagram of parallelogram $ABCD$, $m\angle B = 5x$ and $m\angle C = 2x + 12$. Find the number of degrees in $\angle D$.



37 Tracey has two empty cube-shaped containers with sides of 5 inches and 7 inches, as shown in the accompanying diagram. She fills the smaller container completely with water and then pours all the water from the smaller container into the larger container. How deep, to the *nearest tenth of an inch*, will the water be in the larger container?



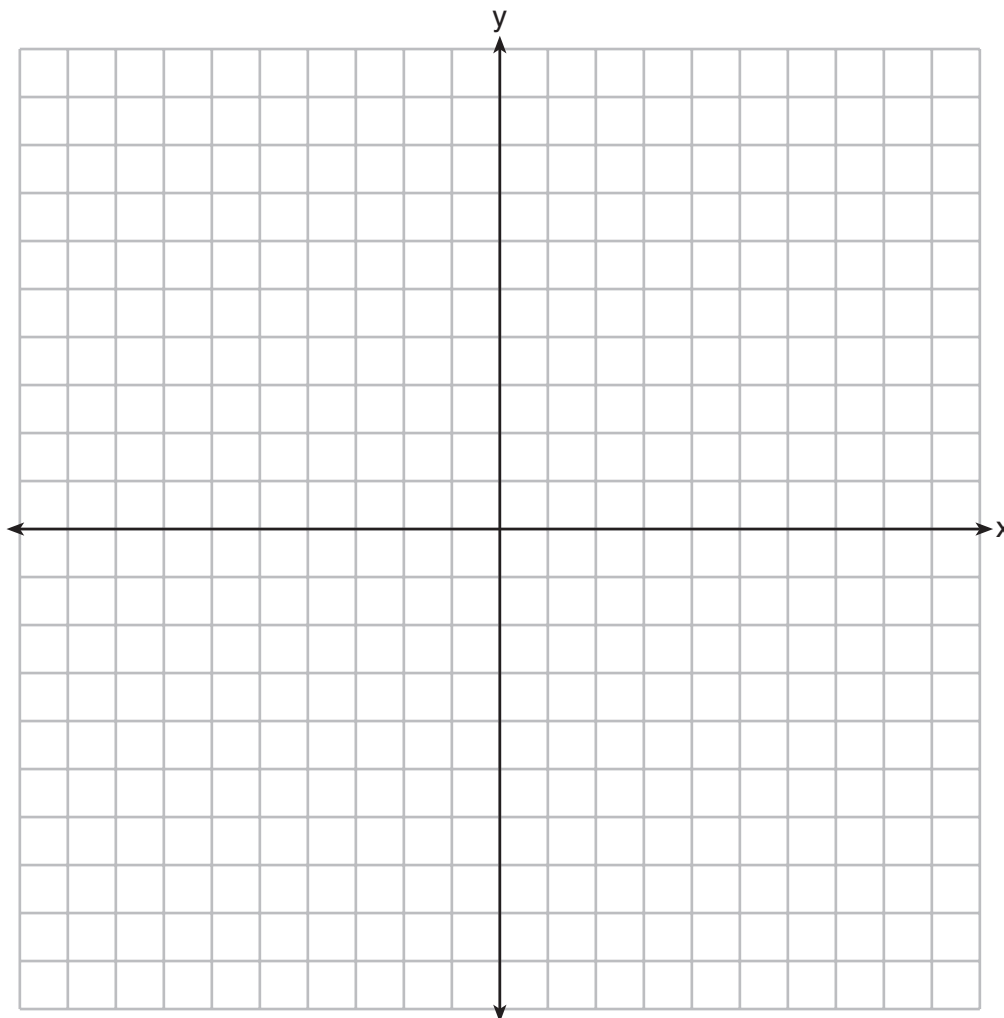
Part IV

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [8]

- 38 Angelo, Brandon, and Carl work in the same office. Angelo's age is 4 years more than twice Carl's age. Brandon is 5 years younger than Carl. The average of the three ages is 41. Find the age of *each* of the men.

39 Carson is a decorator. He often sketches his room designs on the coordinate plane. He has graphed a square table on his grid so that its corners are at the coordinates $A(2,6)$, $B(7,8)$, $C(9,3)$, and $D(4,1)$. To graph a second identical table, he reflects $ABCD$ over the y -axis.

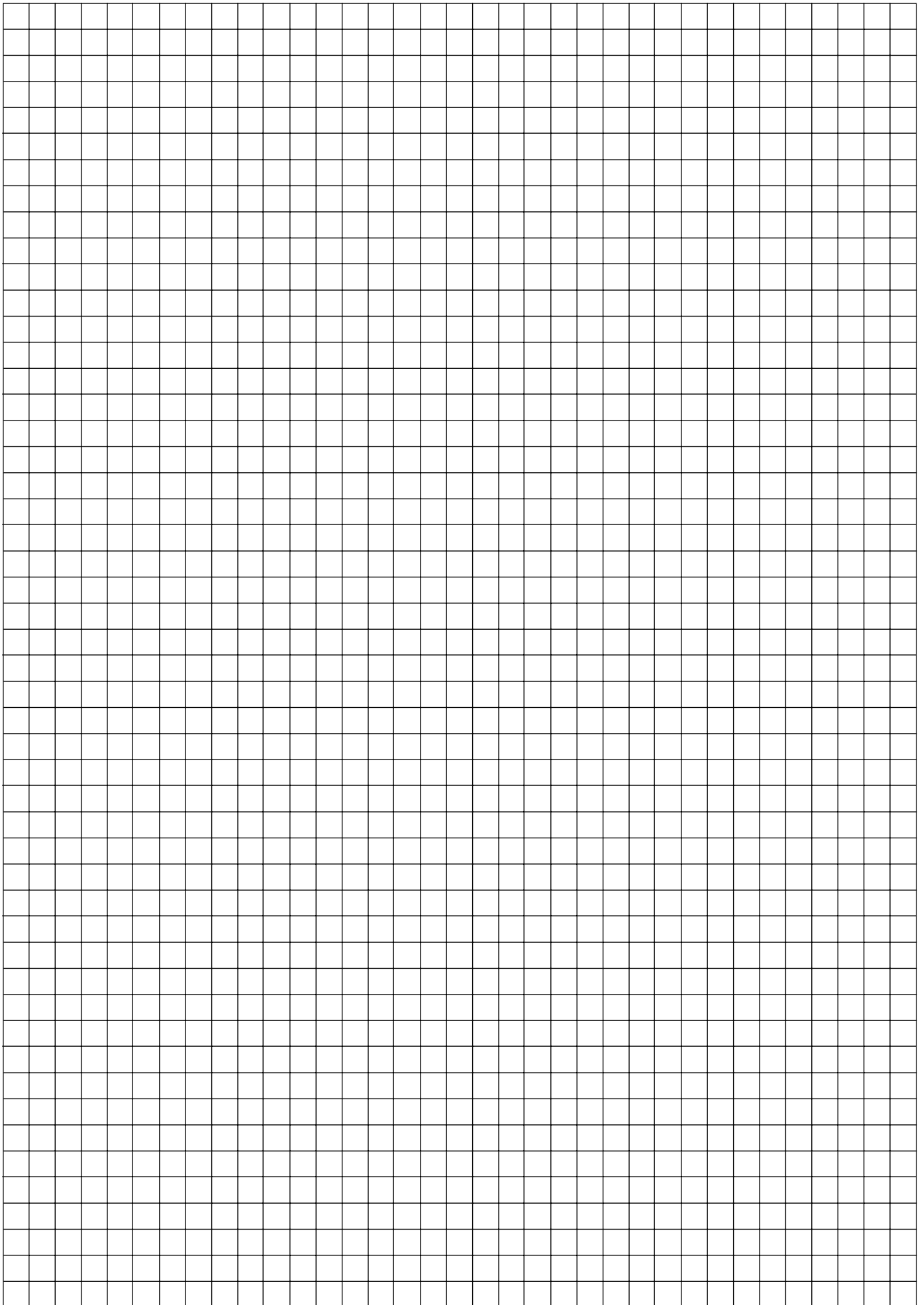
On the accompanying set of coordinate axes, sketch and label $ABCD$ and its image $A'B'C'D'$, which show the locations of the two tables. Then find the number of square units in the area of $ABCD$.



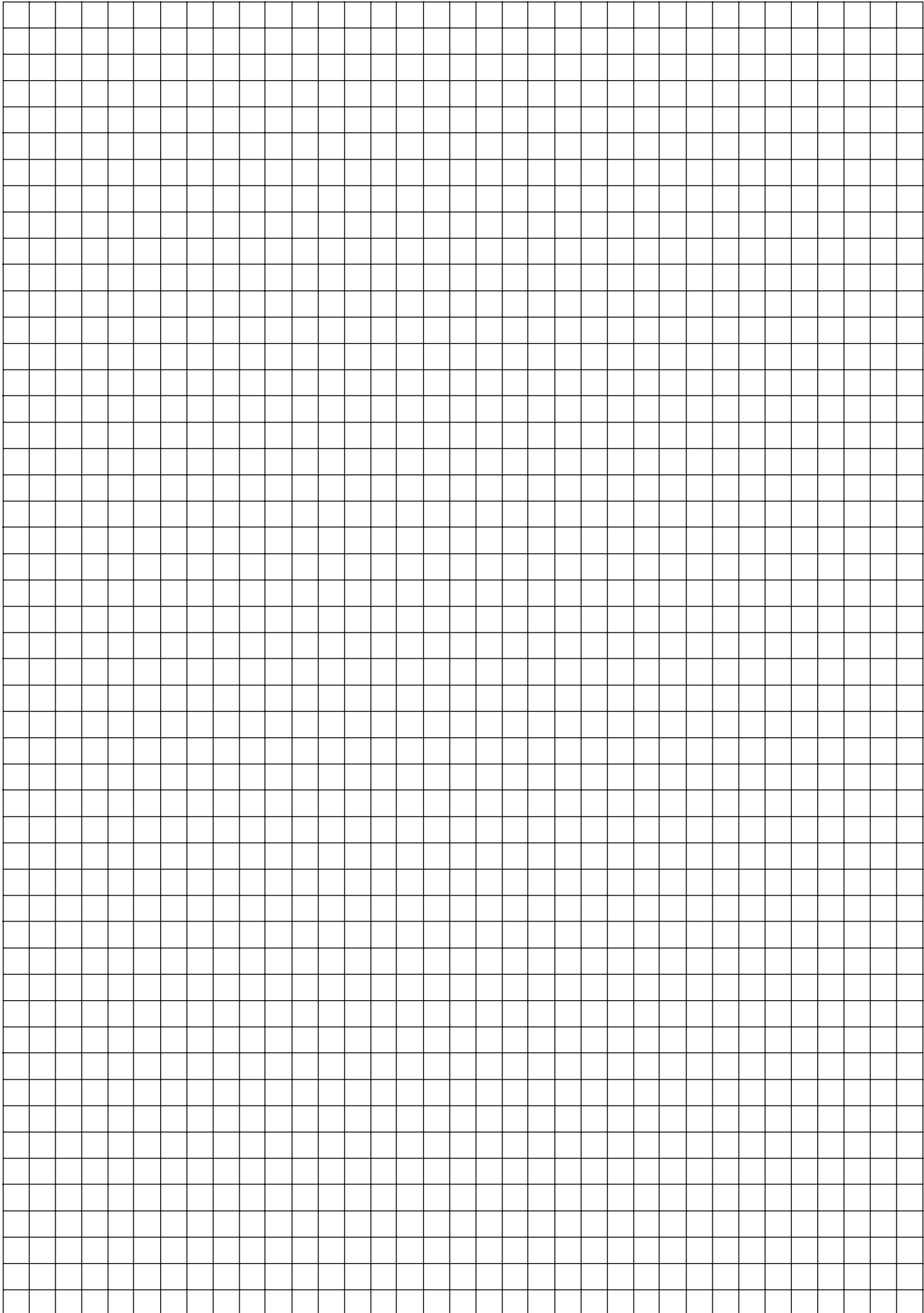
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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS A

Thursday, June 14, 2007 — 1:15 to 4:15 p.m., only

ANSWER SHEET

Student Sex: Male Female Grade

Teacher School

Your answers to Part I should be recorded on this answer sheet.

Part I

Answer all 30 questions in this part.

- 1 9 17 25
2 10 18 26
3 11 19 27
4 12 20 28
5 13 21 29
6 14 22 30
7 15 23
8 16 24

Your answers for Parts II, III, and IV should be written in the test booklet.

The declaration below should be signed when you have completed the examination.

I do hereby affirm, at the close of this examination, that I had no unlawful knowledge of the questions or answers prior to the examination and that I have neither given nor received assistance in answering any of the questions during the examination.

Signature

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