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

Answer 30 questions from this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Write your answers in the spaces provided on the separate answer sheet. Where applicable, answers may be left in terms of $\pi$ or in radical form.

1. Solve for $x$: $5x + 2x - 4 = 4x + 5$

2. In the accompanying diagram of rectangle $ABCD$, diagonal $AC = 8x + 4$ and diagonal $BD = 5x + 16$. Find the value of $x$.

3. If the probability of rain is $\frac{6}{10}$, what is the probability that it will not rain?

4. The accompanying histogram shows the results of a survey of the number of hours a group of teenagers listened to their CD players each day. What is the total number of teenagers who were surveyed?

5. Solve for $x$: $\frac{4}{3}x - 6 = 10$

6. Express $\frac{51}{34}$ as a whole number.

7. Solve for $a$ in terms of $b$, $c$, and $d$:
   
   \[ab + c = d\]

8. In the accompanying diagram, parallel lines $\overrightarrow{EF}$ and $\overrightarrow{GH}$ are cut by transversal $\overrightarrow{LM}$ at $N$ and $P$, respectively. If $m\angle LNF = 54$, find $m\angle NPG$.

9. In the accompanying diagram of isosceles triangle $ABC$, $\overline{AB} \cong \overline{BC}$, $\overline{AC}$ is extended to $D$, and $m\angle A = 42$. Find $m\angle BCD$.

10. Solve for the positive value of $x$: $x^2 - 49 = 0$

11. What is the area of figure $ABCD$ that is formed by coordinates $A(0,0)$, $B(5,0)$, $C(5,3)$, and $D(0,3)$?

12. Write, in symbolic form, the converse of $\sim p \rightarrow q$.

13. If $x$ varies directly as $y$ and $x = 3$ when $y = 8$, what is the value of $y$ when $x = 9$?

14. Solve the following system of equations for $x$:
   
   \[
   \begin{align*}
   -3x + 2y &= 18 \\
   2y &= 3
   \end{align*}
   \]
Directions (15–35): For each question chosen, write on the separate answer sheet the numeral preceding the word or expression that best completes the statement or answers the question.

15 Which transformation for \( \triangle RST \) is shown in the accompanying diagram?

- \( \text{(1) line reflection} \)
- \( \text{(2) rotation} \)
- \( \text{(3) translation} \)
- \( \text{(4) dilation} \)

![Diagram of \( \triangle RST \) and \( \triangle R'S'T' \)]

16 If \( w + 5 \) represents an even integer, the next smaller even integer is represented by

- \( \text{(1) } 2w - 5 \)
- \( \text{(2) } 2w + 5 \)
- \( \text{(3) } w + 7 \)
- \( \text{(4) } w + 3 \)

17 What is the sum of \( 5x - 6y + z \) and \( 5x - 6y - z \)?

- \( \text{(1) } 10x - 12y + 2z \)
- \( \text{(2) } 10x - 12y \)
- \( \text{(3) } 10x + 12y - z \)
- \( \text{(4) } 10x + 12y \)

18 Rick’s recorded times in four 1-mile runs are 4.8 minutes, 5.3 minutes, 4.7 minutes, and 5.4 minutes. For Rick’s next run, which time will give him a mean of 5.0 minutes?

- \( \text{(1) } 4.8 \text{ min} \)
- \( \text{(2) } 5.3 \text{ min} \)
- \( \text{(3) } 5.7 \text{ min} \)
- \( \text{(4) } 6.0 \text{ min} \)

19 The product of \( (2x - 3)(3x + 5) \) is equivalent to

- \( \text{(1) } 5x^2 - x - 15 \)
- \( \text{(2) } 6x^2 + x + 15 \)
- \( \text{(3) } 5x + 2 \)
- \( \text{(4) } 6x^2 + x - 15 \)

20 Which property is demonstrated by the following equation?

\[ a(b + c) = ab + ac \]

- \( \text{(1) associative property of addition} \)
- \( \text{(2) distributive property} \)
- \( \text{(3) commutative property of addition} \)
- \( \text{(4) identity property of addition} \)

21 What is the total number of different six-letter arrangements that can be formed from the letters in the word “FOREST” if each letter is used only once in each arrangement?

- \( \text{(1) } 1 \)
- \( \text{(2) } 6 \)
- \( \text{(3) } 720 \)
- \( \text{(4) } 46,656 \)

22 What is the \( y \)-intercept of the line whose equation is \( y = 6x - 7 \)?

- \( \text{(1) } -6 \)
- \( \text{(2) } 6 \)
- \( \text{(3) } 7 \)
- \( \text{(4) } -7 \)

23 Which inequality is equivalent to \( 2x - 1 > 5 \)?

- \( \text{(1) } x > 6 \)
- \( \text{(2) } x > 2 \)
- \( \text{(3) } x < 3 \)
- \( \text{(4) } x > 3 \)

24 One factor of \( x^2 + 5x - 24 \) is

- \( \text{(1) } x - 8 \)
- \( \text{(2) } x - 6 \)
- \( \text{(3) } x - 3 \)
- \( \text{(4) } x + 4 \)

25 What is the sum of \( \frac{6x}{5} \) and \( \frac{2x}{3} \), expressed as a single fraction in lowest terms?

- \( \text{(1) } \frac{8x}{35} \)
- \( \text{(2) } \frac{12x}{35} \)
- \( \text{(3) } \frac{44x}{35} \)
- \( \text{(4) } \frac{44x}{12} \)

26 In two supplementary angles, the measure of one angle is 6 more than twice the measure of the other. The measures of these two angles are

- \( \text{(1) } 28^\circ \text{ and } 62^\circ \)
- \( \text{(2) } 32^\circ \text{ and } 58^\circ \)
- \( \text{(3) } 58^\circ \text{ and } 122^\circ \)
- \( \text{(4) } 62^\circ \text{ and } 118^\circ \)

27 In the truth table below, which statement is the correct heading for column 4?

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
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<tr>
<td>( p )</td>
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<td>( \sim p )</td>
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</table>

- \( \text{(1) } \sim p \lor q \)  \( \text{(2) } \sim p \land q \)  \( \text{(3) } \sim p \rightarrow q \)  \( \text{(4) } q \leftrightarrow \sim p \)
28 In terms of \( x \), what is the area of the rectangle shown below?

\[
\begin{array}{c}
\text{x} \\
(x + 3)
\end{array}
\]

(1) \( x^2 + 3x \)  
(2) \( 2x + 3 \)  
(3) \( 4x + 6 \)  
(4) \( 5x \)

29 What is the volume of a cube whose edge has a length of 4?

(1) 12  
(2) 24  
(3) 64  
(4) 96

30 If the circumference of a circle is \( 36\pi \), what is the length of a radius of the circle?

(1) 6  
(2) 18  
(3) 36  
(4) 72

31 For which value of \( x \) is the expression \( \frac{4x}{x + 6} \) undefined?

(1) 0  
(2) 2  
(3) 6  
(4) -6

32 Which monomial is equivalent to \( (7x^4)^2 \)?

(1) \( 49x^6 \)  
(2) \( 49x^8 \)  
(3) \( 14x^6 \)  
(4) \( 14x^8 \)

33 The length of the hypotenuse of a right triangle is 7, and the length of one leg is 4. What is the length of the other leg?

(1) \( \sqrt{33} \)  
(2) 33  
(3) \( \sqrt{65} \)  
(4) 65

34 Which graph represents the inequality \( x \geq 2 \)?

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

35 Which figure does not always possess line symmetry?

(1) square  
(2) rectangle  
(3) circle  
(4) parallelogram

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36  a On the same set of coordinate axes, graph the following system of equations.
\[ y = -4 \quad [2] \]
\[ 2x + y = 6 \quad [4] \]

b Find the area of the trapezoid bounded by the x-axis, the y-axis, and the graphs drawn in part a. [4]

37 In the accompanying diagram, rectangle MATH is inscribed in circle O. The length of radius OT is 5 centimeters and the length of OH is 6 centimeters.

a Find the length of MH in centimeters. [3]

b Find the area of the shaded region to the nearest square centimeter. [7]

38 There are four coins in a jar: a penny, a nickel, a dime, and a quarter. One coin is removed at random. Without replacing the first coin, a second coin is removed.

a Draw a tree diagram or list the sample space showing all the possible outcomes. [4]

b Find the probability that the total value of the two coins selected is
   (1) 11 cents [2]
   (2) greater than 35 cents [2]
   (3) at most 30 cents [2]

39 The sum of two integers is 10, and the sum of their squares is 250. Find the two integers. [Only an algebraic solution will be accepted.] [4,6]

40 Solve the following system of equations algebraically and check.
\[ 0.7x + 0.4y = 16 \]
\[ x + y = 10 \quad [8, 2] \]

41 A museum sold 50 more adult tickets at $6.50 each than children’s admission tickets at $5.50 each. What is the minimum number of each type of ticket that the cashier had to sell for the total receipts to be at least $1000? [Show or explain the procedure used to obtain your answer.] [10]

42 a Each set below consists of three sentences. Assume that the first two sentences are true. On your answer paper, write the truth value “true” or “false” for the third sentence in each set. If the truth value cannot be determined from the given information, write “cannot be determined.” [22]

(1) If Chris gets her homework done, then she will go to the volleyball game.
   Chris goes to the volleyball game.
   Chris gets her homework done.

(2) I do not study and I do not pass my test.
   I do not study.
   I pass my test.

b On your answer paper, copy and complete the truth table for the statement \( \neg(p \land q) \rightarrow \neg q \). [6]

<table>
<thead>
<tr>
<th>p</th>
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<th>\neg q</th>
<th>\neg(p \land q) \rightarrow \neg q</th>
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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH – COURSE I

Wednesday, August 16, 2000 — 8:30 to 11:30 a.m., only

ANSWER SHEET

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

Part I

Answer 30 questions from this part.

1 . . . . . . . . . . . . . . . . . . . 11 . . . . . . . . . . . . . . . . . . 21 . . . . . . . . . . . . . . . . . . 31 . . . . . . . . . . . . . .

2 . . . . . . . . . . . . . . . . . . . 12 . . . . . . . . . . . . . . . . . . 22 . . . . . . . . . . . . . . . . . . 32 . . . . . . . . . . . . . .

3 . . . . . . . . . . . . . . . . . . . 13 . . . . . . . . . . . . . . . . . . 23 . . . . . . . . . . . . . . . . . . 33 . . . . . . . . . . . . . .

4 . . . . . . . . . . . . . . . . . . . 14 . . . . . . . . . . . . . . . . . . 24 . . . . . . . . . . . . . . . . . . 34 . . . . . . . . . . . . . .

5 . . . . . . . . . . . . . . . . . . . 15 . . . . . . . . . . . . . . . . . . 25 . . . . . . . . . . . . . . . . . . 35 . . . . . . . . . . . . . .

6 . . . . . . . . . . . . . . . . . . . 16 . . . . . . . . . . . . . . . . . . 26 . . . . . . . . . . . . . . . . . .

7 . . . . . . . . . . . . . . . . . . . 17 . . . . . . . . . . . . . . . . . . 27 . . . . . . . . . . . . . . . . . .

8 . . . . . . . . . . . . . . . . . . . 18 . . . . . . . . . . . . . . . . . . 28 . . . . . . . . . . . . . . . . . .

9 . . . . . . . . . . . . . . . . . . . 19 . . . . . . . . . . . . . . . . . . 29 . . . . . . . . . . . . . . . . . .

10 . . . . . . . . . . . . . . . . . . 20 . . . . . . . . . . . . . . . . . . 30 . . . . . . . . . . . . . . . . . .

Your answers for Part II should be placed on paper provided by the school.

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

Math. – Course I – Aug. ’00

[7]