

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Tuesday, June 20, 2000 — 1:15 to 4:15 p.m., only

Notice . . .

Scientific calculators must be available to all students taking this examination.

The last page of the booklet is the answer sheet. 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.

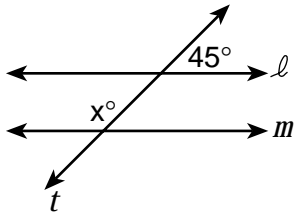
When you have completed the examination, you must sign the statement printed at the end of the answer paper, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during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

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

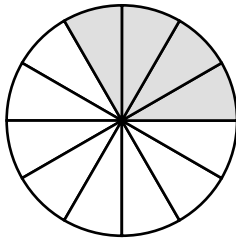
Part I

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 π or in radical form. [60]

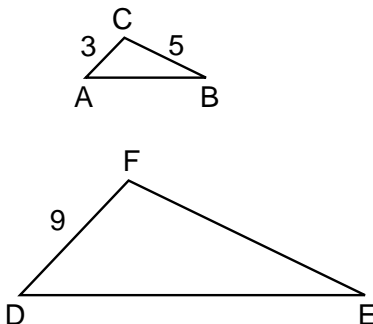
- 1 Allison purchased 4 shirts and a number of pairs of slacks. Using these shirts and slacks, she can wear 20 different outfits consisting of a shirt and a pair of slacks. How many slacks did she buy?
- 2 In the accompanying diagram, parallel lines ℓ and m are cut by transversal t at a 45° angle. Find the number of degrees in the measure of angle x .



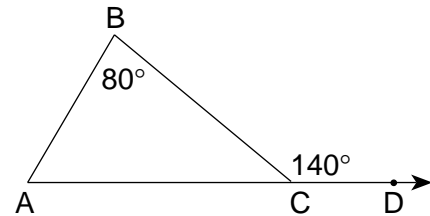
- 3 The accompanying circle represents the 2400 students at Central High School, and the shaded portion represents the freshman class. What is the total number of students in the freshman class?



- 4 In the accompanying diagram, $\triangle ABC$ is similar to $\triangle DEF$, $AC = 3$, $CB = 5$, and $DF = 9$. Find FE .



- 5 Solve for y : $6y - 4 = 2y + 10$
- 6 The perimeter of a regular pentagon is 60. What is the length of one side of the pentagon?
- 7 The formula for changing Celsius (C) temperature to Fahrenheit (F) temperature is $F = 1.8C + 32$. What is the number of degrees in the value of C when $F = 68^\circ$?
- 8 In the accompanying diagram, \overline{AC} is extended from C through D, $m\angle BCD = 140$, and $m\angle B = 80$. Find $m\angle BAC$.



- 9 The table below shows the distribution of bowling scores. In which interval does the median lie?

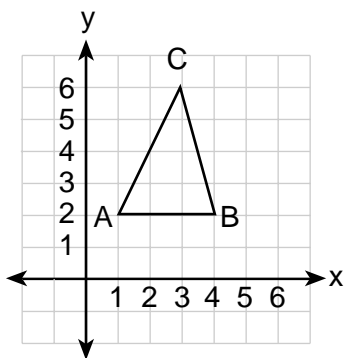
Interval	Frequency
91-110	10
111-130	11
131-150	8
151-170	4
171-190	6
191-210	5

- 10 Solve this system of equations for x :

$$\begin{aligned} 2x - 3y &= 10 \\ x + 3y &= 14 \end{aligned}$$

- 11 What is the y -intercept of the line whose equation is $y = 7x + 5$?
- 12 The radius of a circle is represented by $3x + 2$, and the length of the diameter is 22 centimeters. Find the value of x , in centimeters.
- 13 The hypotenuse of a right triangle is 26 centimeters and one leg is 24 centimeters. Find the number of centimeters in the second leg.
- 14 Solve for the positive value of x : $\frac{1}{4}x^2 = 16$

- 15 If 0.000043 is expressed as 4.3×10^n , what is the value of n ?
- 16 What is the area of $\triangle ABC$ as shown in the accompanying diagram?



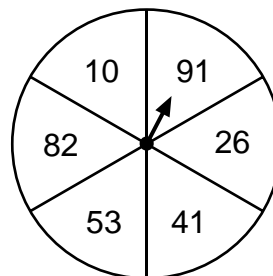
- 17 If a base angle of an isosceles triangle measures 50° , what is the number of degrees in the measure of the vertex angle?

Directions (18–35): 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.

- 18 A different plant is placed on each of the four corners of a square patio. Which expression would be used to find the number of different ways the four plants can be arranged?
- (1) ${}_4P_1$ (2) ${}_4P_2$ (3) ${}_2P_4$ (4) ${}_4P_4$

- 19 Which expression is equivalent to $x^2 + 7x + 6$?
- (1) $(x + 6)(x + 1)$ (2) $(x + 3)(x + 2)$ (3) $(x + 1)(x + 7)$ (4) $x(x + 7)$

- 20 In the accompanying diagram, the circle is divided into six equal parts. If the pointer is spun once, what is the probability that the pointer will land on a number divisible by 3?



- (1) 1 (2) $\frac{2}{6}$ (3) $\frac{1}{6}$ (4) 0

- 21 The numbers in a distribution are represented by $3x$, $x + 2$, $2x$, and $x - 5$. If $x = 2$, then the mode of these numbers is
- (1) 6 (2) 2 (3) -3 (4) 4

- 22 Which property is illustrated by the equation $3(x + 4) = 3x + 12$?
- (1) associative property of addition (2) commutative property of addition (3) distributive property of multiplication over addition (4) transitive property of equality

- 23 Nine students scored 75 or less on a mathematics test. If 75 is the 25th percentile, what is the number of students who took this test?
- (1) 6 (2) 12 (3) 36 (4) 45

- 24 If the area of a rectangle is represented by $8x^3y^6$ and the width is represented by $2xy^2$, the length is represented by
- (1) $4x^2y^4$ (2) $6x^2y^4$ (3) $4x^2y^3$ (4) $6x^2y^3$

25 The sum of $\frac{5x}{2}$ and $\frac{3x}{5}$ is

- (1) $\frac{8x}{7}$ (3) $\frac{15x}{10}$
 (2) $\frac{8x}{10}$ (4) $\frac{31x}{10}$

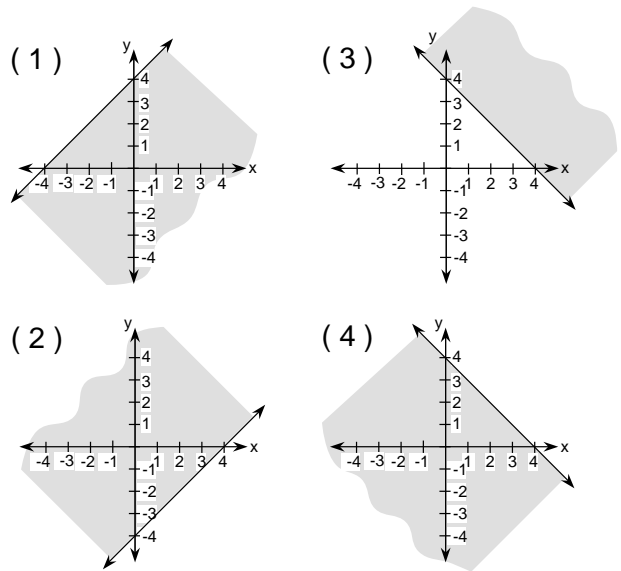
26 The expression $5(x - 3) - 4(x - 3)$ is equivalent to

- (1) 1 (3) $x - 6$
 (2) $x - 3$ (4) $x - 27$

27 Which letter has horizontal but does *not* have vertical line symmetry?

- (1) **B** (3) **O**
 (2) **W** (4) **N**

28 Which graph illustrates the relationship $x + y \leq 4$?



29 Which statement is always true?

- (1) $p \wedge \sim p$ (3) $p \rightarrow \sim p$
 (2) $p \vee \sim p$ (4) $p \leftrightarrow \sim p$

30 Which of these expressions is undefined when $x = 5$?

- (1) $\frac{x-5}{1}$ (3) $\frac{1}{x-5}$
 (2) $\frac{-5-x}{1}$ (4) $x - 5$

31 The expression $2\sqrt{2} - \sqrt{50}$ is equivalent to

- (1) $\sqrt{48}$ (3) $-7\sqrt{2}$
 (2) $-3\sqrt{2}$ (4) $5\sqrt{2}$

32 Triangle $A'B'C'$ is the image of $\triangle ABC$ under a given transformation. If $\triangle A'B'C'$ is similar but not congruent to $\triangle ABC$, the transformation must be a

- (1) dilation (3) rotation
 (2) line reflection (4) translation

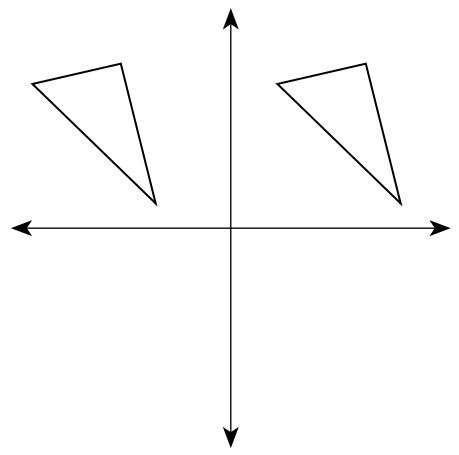
33 A cube whose edge has a length of 4 has the same volume as a rectangular box whose length is 8 and whose width is 4. The height of the rectangular box is

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

34 What is the value of $\frac{3}{4} \left(\frac{2}{3}\right)^0$?

- (1) 1 (3) $\frac{3}{4}$
 (2) $\frac{4}{3}$ (4) $\frac{6}{12}$

35 Which transformation is shown in the accompanying diagram?



- (1) reflection (3) rotation
 (2) translation (4) dilation

Answers to the following questions are to be written on paper provided by the school.

Part II

Answer four questions from this part. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Calculations that may be obtained by mental arithmetic or the calculator do not need to be shown. [40]

36 a On the same set of coordinate axes, graph the lines of the following equations.

(1) $y - 2x = 1$ [3]

(2) $3x + y = 6$ [3]

(3) $y = -3$ [2]

b Write the coordinates of all the vertices of the triangle formed by the lines graphed in part a. [2]

37 a On your answer paper, construct and complete a truth table for the statement $(\sim p \wedge q) \leftrightarrow (p \vee q)$. [9]

b Based on the truth table completed in part a, is the statement $(\sim p \wedge q) \leftrightarrow (p \vee q)$ a tautology? [1]

38 Cedric and Zelda went shopping at Price Buster. Cedric bought 2 jumbo rolls of aluminum foil and 3 packages of AA batteries for a total cost of \$21. Zelda bought 5 identical jumbo rolls of aluminum foil and 2 identical packages of AA batteries for a total cost of \$25. Find the cost of 1 roll of aluminum foil and find the cost of 1 package of AA batteries. [Only an algebraic solution will be accepted.] [10]

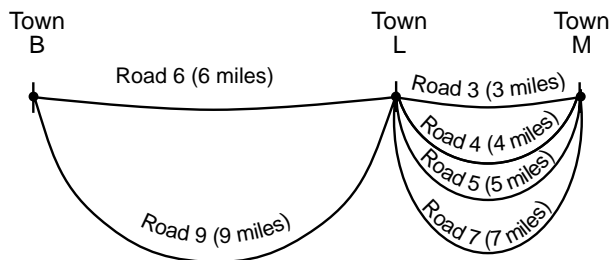
39 The measures of the angles of $\triangle ABC$ are represented by $x^2 + 5$, $6x - 3$, and $x + 8$.

a Find the measure of each angle of this triangle. [Only an algebraic solution will be accepted.] [8]

b Which type of triangle is $\triangle ABC$? [2]

40 A bank contains 30 coins, consisting of nickels, dimes, and quarters. There are twice as many nickels as quarters and the remaining coins are dimes. If the total value of the coins is \$3.35, what is the number of each type of coin in the bank? [Show or explain the procedure used to obtain your answer.] [10]

41 The accompanying diagram shows two roads that lead from Town B to Town L and four roads that go from Town L to Town M. The numbers in parentheses show the distances between each of these towns.



a Draw a tree diagram or list the sample space showing all possible routes from Town B to Town M. [4]

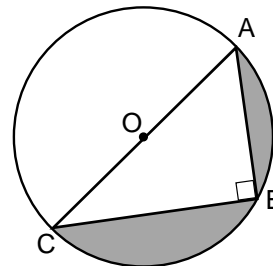
b Bonnie traveled from Town B to Town M, passing through Town L. Find the probability that

(1) both roads she chose are odd-numbered roads [2]

(2) the total distance in miles from Town B to Town M is a prime number [2]

(3) the distance from Town B to Town M is less than 9 miles [2]

42 In the accompanying diagram, right triangle ABC , with the right angle at B , is inscribed in circle O , \overline{AC} is a diameter, $AB = 6$ centimeters, and $BC = 8$ centimeters. Find the area of the shaded region to the nearest tenth of a square centimeter. [10]



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REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH – COURSE I

Tuesday, June 20, 2000 — 1:15 to 4:15 p.m., only

Part I Score
Part II Score
Total Score
Rater's Initials:

ANSWER SHEET

Pupil Sex: Male Female Grade

Teacher School

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

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