

The University of the State of New York
 REGENTS HIGH SCHOOL EXAMINATION
NINTH YEAR MATHEMATICS

Tuesday, January 25, 1966 — 1:15 to 4:15 p.m., only

The last page of the booklet is the answer sheet, which is perforated. Fold the last page along the perforation and then, slowly and carefully, tear off the answer sheet. Now fill in the heading of your answer sheet. When you have finished the heading, you may begin the examination immediately.

Part I

Answer all questions in 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.

- 1 From $-2x + 3y$ subtract $-x - 5y$.
- 2 Evaluate $-3x^2$ if $x = -5$.
- 3 Factor completely: $2y^2 - 18$
- 4 Solve for x : $4x - (x - 10) = 40$
- 5 Solve for n : $\frac{n}{3} + 2 = 5$
- 6 Express as a binomial the average of $5a + 2$ and $3a - 6$.
- 7 Combine into a single fraction in simplest form:

$$\frac{3k + 2}{4} + \frac{k - 4}{3}$$
- 8 Find the value of $\sqrt{59}$ to the *nearest tenth*.
- 9 If Harry, working at a steady rate, can complete a job in t hours, what part of the job will he finish in 3 hours?
- 10 Find the quotient when $4n^2 - 29n + 45$ is divided by $n - 5$.
- 11 Given the formula $p = 2(l + w)$, express l in terms of p and w .
- 12 Solve for y : $1.8y - 2.3 = 3.3y + 5.2$
- 13 The length of a rectangle is represented by $3x + 4$ and the width by $2x - 1$. Express the area of the rectangle as a trinomial in terms of x .
- 14 A boy 6 feet tall casts a shadow 15 feet long. Find the number of feet in the height of a nearby tower which casts a shadow 100 feet long at the same time.
- 15 Solve for a : $\frac{3}{4a} + \frac{6}{5a} = \frac{13}{20}$
- 16 Solve for n : $\frac{n + 1}{4} = \frac{7}{12}$
- 17 Solve for x : $x^2 - 5x - 24 = 0$
- 18 If y yards of ribbon cost n cents, express in terms of y and n the number of cents in the cost of 1 yard.
- 19 In right $\triangle ABC$, $\angle C = 90^\circ$, $AC = 3$ and $BC = 4$. Find as a common fraction the numerical value of $\tan B$.
- 20 The area of a square is $121x^2$. Express in terms of x the length of a side of the square.
- 21 A rectangular floor is 9 feet wide and 12 feet long. Find the number of feet in the distance from one corner of the floor to the diagonally opposite corner.
- 22 What value of k will make $x^2 + 6x + k$ a perfect square?

Directions (23–30a): Write in the space provided on the separate answer sheet the *number* preceding the expression that best completes *each* statement or answers *each* question.

23 The sum of $\frac{1}{k}$ and $\frac{1}{l}$ is

- (1) $\frac{1}{k+l}$ (3) $\frac{1}{kl}$
 (2) $\frac{2}{k+l}$ (4) $\frac{k+l}{kl}$

24 The expression $2\sqrt{48}$ is equal to

- (1) $8\sqrt{12}$ (3) $6\sqrt{3}$
 (2) $8\sqrt{3}$ (4) $\sqrt{96}$

25 The fraction $\frac{a^2 + 36}{a + 6}$ is

- (1) equal to $a + 6$
 (2) equal to $a - 6$
 (3) equal to 6
 (4) already in simplest form

26 The larger of two angles is 6 less than twice the smaller angle, and the sum of the two angles is 72° . If x represents the number of degrees in the smaller angle, which equation can be used to find x ?

- (1) $x + (2x - 6) = 72$
 (2) $x + (6x - 2) = 72$
 (3) $x + (6 - 2x) = 72$
 (4) $2x - 6 = 72$

27 If $\frac{x}{y} = -1$, then $x^2 - y^2$ is equal to

- (1) 1 (3) $2x^2$
 (2) 0 (4) $2y^2$

28 Which of the following is *not* an equation of a straight line?

- (1) $y = 2$ (3) $x = 3y + 2$
 (2) $y = 3x + 2$ (4) $y = 3x^2$

29 The formula for the volume of a cube with edge e is $V = e^3$. If the edge of one cube is 2 and the edge of another cube is 4, how does the volume of the larger cube compare with the volume of the smaller cube?

- (1) eight times as great
 (2) twice as great
 (3) three times as great
 (4) four times as great

30 Answer *either a or b* but *not* both:

a Which number pair corresponds to a point which lies on the graph of $3x + 2y = 4$?

- (1) $(-1, 2)$ (3) $(2, -1)$
 (2) $(-4, 4)$ (4) $(2, 0)$

OR

b On the answer sheet, construct an equilateral triangle RST with RS as the base. [Leave all construction lines on the paper.]

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

Part II

Answer four questions from this part. Show all work unless otherwise directed.

- 31 Solve *graphically* and check: [8,2]

$$\begin{aligned}x + 2y &= 7 \\ 2x - y &= -1\end{aligned}$$

- 32 Write an equation or a system of equations that may be used in solving problem *a* and problem *b*. In *each* case, state what the variable or variables represent. [Solution of the equations is not required.]

a The sum of the digits of a two-digit number is 9. If the digits are reversed, the new number is 9 less than the original number. Find the original number. [5]

b Part of \$1,000 is invested at 7% and the remainder at 2%. The total annual income from both investments is \$32. Find the number of dollars invested at each rate. [5]

- 33 For half of the time on an auto trip, a man drove at an average rate of 45 miles per hour. The rest of the time he drove at an average rate of 50 miles per hour. If he traveled 380 miles altogether, how many hours did it take him to make the trip? Check. [Only an algebraic solution will be accepted.] [4,4,2]

34 *a* The legs of a right triangle are 69 and 74. Find to the *nearest degree* the number of degrees in the smaller acute angle of the right triangle. [5]

b A ladder 32 feet long leans against a wall, making an angle of 75° with level ground. Find to the *nearest foot* the distance from the top of the ladder to the ground. [5]

- 35 The sum of the areas of two square plots is 130 square feet. The side of one plot is 2 feet longer than the side of the other. Find in feet the length of a side of *each* square. [4,6]

- 36 *a* Solve for x and check: [4,2]

$$\frac{x}{3} - \frac{5}{3} = \frac{2}{x}$$

b Perform the indicated division and express the result in simplest form: [4]

$$\frac{r^2 - 25}{5r^2} \div \frac{(r - 5)^2}{r^2 - 5r}$$

- 37 Find two consecutive integers such that if 7 more than the first is divided by 9 less than the second, the quotient is 6. [5,5]

*38 On the same set of axes, draw the graphs of $y > 2x - 1$ and $y > 3$. Indicate on the graph their common solution. [4,4,2]

*39 *Directions (a-e)*: List the letters *a* through *e* on your answer paper. After *each* letter write the *number* preceding the set, *chosen from the list below*, which is best described in that question. [10]

- (1) { }
- (2) {0}
- (3) {2,3,5,7}
- (4) {1,2,3,5,7}
- (5) {1,3,5,7,9}
- (6) {3,4,5,6,7}
- (7) {2,3,4,5,6,7}

- a* The set of positive primes < 10
- b* The set of positive odd integers < 10
- c* A set containing no elements
- d* The solution set of $y + 5 = 5$
- e* The solution set of $2 \leq x < 8$, where x is an integer

* These questions are based on material beyond the scope of the syllabus.

FOR TEACHERS ONLY

9

SCORING KEY

NINTH YEAR MATHEMATICS

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Use only *red* ink or pencil in rating Regents papers. Do not attempt to *correct* the pupil's work by making insertions or changes of any kind. Use checkmarks to indicate pupil errors.

Unless otherwise specified, mathematically correct variations in the answers will be allowed. Units need not be given when the wording of the questions allows such omissions.

Part I

Allow 2 credits for each correct answer; allow no partial credit.

- | | | |
|---------------------------|--|---------|
| (1) $-x + 8y$ | (11) $\frac{p - 2w}{2}$ or $\frac{p}{2} - w$ | (21) 15 |
| (2) -75 | (12) -5 | (22) 9 |
| (3) $2(y + 3)(y - 3)$ | (13) $6x^2 + 5x - 4$ | (23) 4 |
| (4) 10 | (14) 40 | (24) 2 |
| (5) 9 | (15) 3 | (25) 4 |
| (6) $4a - 2$ | (16) $\frac{4}{3}$ | (26) 1 |
| (7) $\frac{13k - 10}{12}$ | (17) 8,—3 | (27) 2 |
| (8) 7.7 | (18) $\frac{n}{y}$ | (28) 4 |
| (9) $\frac{3}{t}$ | (19) $\frac{3}{4}$ | (29) 1 |
| (10) $4n - 9$ | (20) $11x$ | (30a) 3 |

[OVER]

NINTH YEAR MATHEMATICS — *concluded*

Part II

Please refer to the Department's pamphlet *Suggestions on the Rating of Regents Examination Papers in Mathematics*. Care should be exercised in making deductions as to whether the error is purely a mechanical one or due to a violation of some principle. A mechanical error generally should receive a deduction of 10 percent, while an error due to a violation of some cardinal principle should receive a deduction ranging from 30 percent to 50 percent, depending on the relative importance of the principle in the solution of the problem.

(32) a u = units digit
 t = tens digit
 $t + u = 9$
 $10u + t = 10t + u - 9$ [5]
 b a = amount at 7%
 $.07a + .02(1000 - a) = 32$ [5]

(33) Analysis [4]
 8 [4]

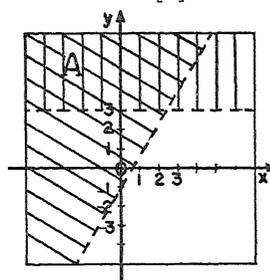
(34) a 43 [5]
 b 31 [5]

(35) Analysis [4]
 7, 9 [6]

(36) a 6, -1 [4]
 b $\frac{r + 5}{5r}$ [4]

(37) Analysis [5]
 11, 12 [5]

(38) The region labeled A , boundary lines excluded. [2]



[4,4]

(39) a 3 [2]
 b 5 [2]
 c 1 [2]
 d 2 [2]
 e 7 [2]