

NINTH YEAR MATHEMATICS

Wednesday, August 18, 1965 — 12:30 to 3:30 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 The sides of a triangle are represented by $a + 5$, $a + 5$ and $2a - 1$. Express in *simplest form* the perimeter of this triangle in terms of a .

2 Subtract $3x^2 - 4x + 1$ from $2x^2 + 5x + 1$.

3 Find the value of $3a - b$ if $a = 0$ and $b = -4$.

4 A train requires 5 hours and 20 minutes to go a distance of 304 miles. Find its average speed in miles per hour for this trip.

5 Solve for w : $2w - 4(w + 3) = 4$

6 Solve for y : $.8y - 1.1 = 4.9 - .2y$

7 Solve for n : $\frac{n}{3} + 5 = \frac{n}{6}$

8 Divide $8x^2 + 4x$ by $4x$.

9 Find to the *nearest tenth* the square root of 88.

10 Express the fraction $\frac{3x - 6}{x^2 + 3x - 10}$ in its *lowest* terms.

11 Given the formula $v = gt + k$. Express t in terms of v , g and k .

12 Write a linear equation expressing the relationship between x and y as shown in the following table:

x	-1	0	1	3
y	-2	1	4	10

13 Factor: $4x^2 - 9y^2$

14 In rectangle $ABCD$, $AB = 16$ feet and $BC = 12$ feet. Find the number of feet in the length of AC .

15 Solve for x : $\frac{3}{8} = \frac{11}{x}$

16 Find two values of a which satisfy the equation:
 $\frac{a^2 - 14}{5} = 10$

17 Solve the following set of equations for x and y :

$$\begin{aligned} x &= 3y + 5 \\ x + y &= 29 \end{aligned}$$

18 The point $(4, k)$ lies on the graph of $5x + 2y = 6$. What is the value of k ?

19 A vertical flagpole casts a shadow 35 feet long on level ground at the same time that a boy 6 feet tall casts a shadow 5 feet long. Find the number of feet in the height of the flagpole.

20 Find to the *nearest degree* the angle whose cosine is 0.3249.

21 If $\frac{a}{b} = 1$, find the value of $a - b$.

22 Which has the greatest value? $\frac{1}{3}$, 45%, 0.5

Directions (23-29): Write in the spaces provided on the separate answer sheet the number preceding the expression that best completes each statement or answers each question.

23 When $x^2 - 4x - 2$ is divided by $x - 3$, the remainder is

- (1) 1
(2) 5
(3) 19
(4) -5

24 The expression $(x - 7)^2$ is equivalent to

- (1) $x^2 + 49$
(2) $x^2 - 49$
(3) $x^2 - 14x + 49$
(4) $x^2 - 7x + 49$

25 Ann bought p stamps at 5 cents each and q stamps at 4 cents each, and she gave the clerk 50 cents. In terms of p and q , her change from 50 cents may be expressed as

- (1) $50 - 5p + 4q$
(2) $50 + (5p + 4q)$
(3) $50 - 5p - 4q$
(4) $50 - .05p - .04q$

26 The sum of $\frac{y - 4}{4y}$ and $\frac{3y - 5}{3y}$ is

- (1) $\frac{4y - 9}{7y}$
(2) $15y - 32$
(3) $\frac{4y - 9}{12y}$
(4) $\frac{15y - 32}{12y}$

27 The width of a rectangle is represented by w . Its length is 3 more than twice its width. An expression which represents the area of this rectangle is

- (1) $2w^2 + 3w$
(2) $2(2w + 3)$
(3) $w^2 + 3w$
(4) $4w^2 + 6w$

28 A window is in the shape of a rectangle surmounted by a semi-circle on the longer side as shown in the accompanying figure. The perimeter of the window is



- (1) $20 + 3\pi$
(2) $20 + 6\pi$
(3) $14 + 3\pi$
(4) $14 + 6\pi$

29 Answer either a or b but not both:

a Which is not equal to $\sqrt{200}$?

- (1) $10\sqrt{2}$
(2) $8\sqrt{5}$
(3) $5\sqrt{8}$
(4) $2\sqrt{50}$

OR

b The difference between $\sqrt{125}$ and $\sqrt{80}$ is

- (1) 1
(2) $9\sqrt{5}$
(3) $\sqrt{45}$
(4) $\sqrt{5}$

30 Answer either a or b but not both:

a Given the formula $V = \frac{1}{3}\pi r^2 h$. Find V if $r = 3$ and $h = 14$. [Use the approximation $\pi = 3\frac{1}{7}$.]

OR

b On the answer sheet, construct the perpendicular bisector of line segment AB .

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

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

$$\begin{aligned}x + 2y &= 4 \\ 3x - y &= 5\end{aligned}$$

- 32 Two planes leave Chicago at the same time and travel in opposite directions. In six hours they are 1,860 miles apart. If one plane travels an average of 50 miles per hour faster than the other, what is the average speed of each plane? Check. [6, 3, 1]

- 33 Solve the following set of equations *algebraically* for x and y and *check* your answers in both equations: [8, 2]

$$3x - 4y = 1$$

$$\frac{y+2}{x} + \frac{8}{5} = \frac{20y+4}{5x}$$

- 34 Write an equation or a system of equations which can be used to solve *each* of the following problems. In each case state what the variable or variables represent. [Solution of the equations is not required.]

a A man has decided to make two investments so that he will receive an annual income of \$1,440. To do this he wishes to invest twice as much money at 6% as he does at 4%. How much must he invest at each rate? [5]

b A rectangular playground is enclosed by 880 feet of fencing. If the length of the playground is 20 feet less than three times the width, find the dimensions of the playground. [5]

- 35 a At a point on level ground 750 feet from the base of a television antenna tower, the angle of elevation of the top of the tower is found to be 39° . Find to the *nearest foot* the height of the tower. [7]
- b The legs of a right triangle are 4 and 7. Find to the *nearest degree* the smaller acute angle of the triangle. [3]

- 36 A merchant had 100 ski jackets to sell. Some were sold early in the season at \$12 each and the remainder were sold at a clearance price of \$9 each. If the total amount of money the merchant received was \$1,098, how many jackets did he sell at \$12? Check. [6, 3, 1]

- 37 Find two positive consecutive integers such that their product diminished by 8 times the smaller integer is 78. [6, 4]

- *38 If the replacement set for the variable x is $\{-4, -3, -2, -1, 0, 1, 2, 3, 4\}$, find the solution set for *each* of the following open sentences:

a $6x + 7 = 3x + 7$ [2]

b $7x = 2x - 9$ [2]

c $-2 \leq x < 4$ [2]

d $-5x > 10$ [2]

e $|x| = 3$ [2]

- *39 Graph in a coordinate plane both of the following inequalities:

$$y \leq x$$

$$x + y \leq 8$$

Indicate the region which consists of all those points whose coordinates satisfy both of these inequalities. [10]

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

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION
NINTH YEAR MATHEMATICS
Wednesday, August 18, 1965 — 12:30 to 3:30 p.m., only

ANSWER SHEET

Pupil..... Teacher.....

School.....

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

Part I

Answer all questions in this part.

- | | | |
|--------|---------|---------|
| 1..... | 9..... | 17..... |
| 2..... | 10..... | 18..... |
| 3..... | 11..... | 19..... |
| 4..... | 12..... | 20..... |
| 5..... | 13..... | 21..... |
| 6..... | 14..... | 22..... |
| 7..... | 15..... | 23..... |
| 8..... | 16..... | 24..... |

Part I Score:.....
Rater's Initials:
.....

Questions 25 through 30 should be answered on the back of this page.

SECTION 1

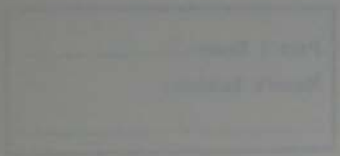
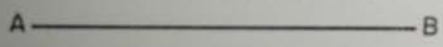
- 25.
- 26.
- 27.
- 28.
- 29 a.

OR

- b.
- 30 a.

OR

- b.



FOR TEACHERS ONLY

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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. In question 20, allow credit if the pupil has not given the degree symbol.

- | | | |
|----------------------------|---------------------------|---|
| (1) $4a + 9$ | (13) $(2x + 3y)(2x - 3y)$ | (23) 4 |
| (2) $-x^2 + 9x$ | (14) 20 | (24) 3 |
| (3) 4 | (15) $\frac{88}{3}$ | (25) 3 |
| (4) 57 | (16) 8, -8 | (26) 4 |
| (5) -8 | (17) $x = 23, y = 6$ | (27) 1 |
| (6) 6 | (18) -7 | (28) 3 |
| (7) -30 | (19) 42 | (29) $\begin{matrix} a & 2 \\ b & 4 \end{matrix}$ |
| (8) $2x + 1$ | (20) 71° | (30) a 132 |
| (9) 9.4 | (21) 0 | |
| (10) $\frac{3}{x + 5}$ | (22) 0.5 | |
| (11) $t = \frac{v - k}{g}$ | | |
| (12) $y = 3x + 1$ | | |

[OVER]

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.

(31) (2,1) [8]
Check [2]

(32) Analysis [6]
130, 180 [3]
Check [1]

(33) $x = 3, y = 2$ [8]
Check [2]

(34) a $x =$ amount invested at 4%
 $.04x + .06(2x) = 1440$ [5]
b $w =$ width of playground
 $2w + 2(3w - 20) = 880$ [5]

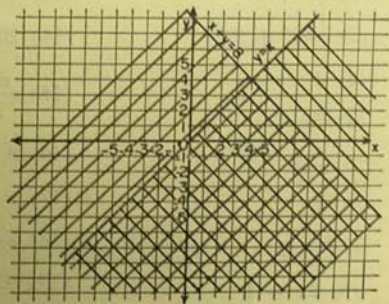
(35) a 607 [7]
b 30° [3]

(36) Analysis [6]
66 [3]
Check [1]

(37) Analysis [6]
13, 14 [4]

(38) a $\{0\}$ or 0 [2]
b $\{ \}$ or ϕ [2]
c $\{-2, -1, 0, 1, 2, 3\}$
or $-2, -1, 0, 1, 2, 3$ [2]
d $\{-3, -4\}$ or $-3, -4$ [2]
e $\{-3, 3\}$ or $-3, 3$ [2]

(39)



The region which consists of all those points whose coordinates satisfy both inequalities is indicated by crosshatching and includes parts of the graphs of $y = x$ and $x + y = 8$. [10]