The University of the State of New York

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REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Wednesday, August 16, 1967 — 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 Find the value of ab^2 when $a = 2$ and $b = -3$.

2 Express the product of $(a + b)$ and $(a + 2b)$ as a trinomial.

3 Solve for the *positive* value of x: $3x^2 = 243$

4 Solve for x: $\frac{1}{4}x + 2 = 0$

5 Which has the smallest value?

$$\frac{3}{5}, \frac{3}{7}, \frac{-2}{7}, \frac{-4}{7}$$

6 The sum of two angles is 180°. If these angles are in the ratio of 1:4, what is the number of degrees in the smaller angle?

7 Solve for h in terms of S and p: $S = \frac{hp}{2}$

8 Find the quotient when $2x^2 + 5x - 3$ is divided by $x + 3$.

9 Find to the *nearest tenth* the positive square root of 7.

10 Find the solution set of the following open sentence: $3(x + 2) + x + 2 = 8$

11 Solve the following set of simultaneous equations for x:

$x + 4y = 24$
$x - y = 9$

12 If 9 is 3 more than $2a$, what is the value of a?

13 Express in *simplest form* the length of a rectangle whose area is $6x^2 + 3x$ and whose width is $3x$.

14 The point $(k,2)$ lies on the graph of $x + 2y = 5$. Find the value of k.

15 Express the fraction $\frac{n^2 - 2n - 3}{n^2 - 1}$ in its *lowest* terms.

16 If $\cos A = \frac{3}{5}$, find angle A to the *nearest degree*.

17 Solve for x: $1.2x - .35 = .5x + 5.25$

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

Directions (19–30): Write in the space provided on the separate answer sheet the *number* preceding the expression that best completes *each* statement or answers *each* question.

19 The product of $2x^2y^3$ and $3x^3y^4$ is

(1) $5x^5y^7$ (3) $5x^6y^{12}$
(2) $6x^5y^7$ (4) $6x^6y^{12}$

20 Which does *not* have a multiplicative inverse?

(1) $\frac{0}{9}$ (3) .13
(2) -10 (4) 5

21 Which number is an integer?

(1) π (3) $\sqrt{25}$
(2) $\sqrt{5}$ (4) $\sqrt{10}$

22 Which of the following is an infinite set?

(1) $\{x \mid x$ is a United States Senator$\}$
(2) $\{x \mid x$ is a positive integer less than one million$\}$
(3) $\{x \mid x$ is an odd integer$\}$
(4) $\{x \mid x$ is a human being who was born in 1952$\}$

23 The number of feet in c inches is

(1) $\frac{c}{12}$ (3) $c + 12$

(2) $12c$ (4) $c - 12$

24 If $3x - 1 \geqq 4$, a value of x which is a member of the solution set is

(1) 1 (3) 3

(2) 0 (4) -1

25 The marked price of a coat was \$36.75, which represented 75% of the original selling price. What was the original selling price?

(1) \$27.56 (3) \$45.94

(2) \$42.35 (4) \$49.00

26 The expression $5\sqrt{2} - \sqrt{32}$ is equivalent to

(1) $\sqrt{18}$ (3) $9\sqrt{2}$

(2) $\sqrt{2}$ (4) $2\sqrt{3}$

27 Which set has the property of closure under the operation addition?

(1) $\{x \mid x$ is an odd integer$\}$

(2) $\{1,2,3,\ldots,10\}$

(3) $\{0,1,2\}$

(4) $\{x \mid x$ is an even integer$\}$

28 The length of the diagonal of a rectangle whose sides are 2 and 3 is

(1) $\sqrt{5}$ (3) 6

(2) $\sqrt{13}$ (4) 4

29 The value of $|-3-8|$ is

(1) 5 (3) 11

(2) -5 (4) -11

30 If $n - 2$ is an even integer, the next larger even integer is

(1) $-n$ (3) $2n$

(2) n (4) $2n - 4$

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

Part II

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

31 Solve graphically and check: [8,2]

$2x - y = -7$
$x + 2y = 4$

32 *a* From a point 150 feet from the foot of a lighthouse, the angle of elevation of the top of the lighthouse is 38 degrees. Find to the *nearest foot* the height of the lighthouse. [6]

b A ladder 25 feet long leans against a wall. The bottom of the ladder is 8 feet from the wall. Find to the *nearest degree* the acute angle which the ladder makes with the ground. [4]

33 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 The sum of three numbers is 22. The second is 3 more than the first and the third is 1 less than twice the first. Find the numbers. [5]

b A grocer has some coffee which sells for 60¢ per pound and some coffee which sells for 78¢ per pound. How many pounds of each should he mix together to get 48 pounds of a mixture which will sell for 75¢ per pound? [5]

34 A man had a rectangular garden 40 feet by 60 feet. He doubled the area by increasing each dimension by the same number of feet. By how many feet did he increase each dimension? Check. [*Only an algebraic solution will be accepted.*] [5,4,1]

35 Solve algebraically the following set of equations for x and y and check in both equations: [8,2]

$3x + y = 9$

$$\frac{3x}{2} + \frac{4y}{5} = \frac{27}{5}$$

36 Working alone, a man can do a certain job in 6 hours. Working together with his helper, the two can do the job in 4 hours. How long would it take the helper to do the job working alone? Check. [*Only an algebraic solution will be accepted.*] [6,3,1]

37 *a* On the same set of axes, graph the following system of inequalities and label the solution set A: [9]

$y \geq -x$
$x + 2y < 4$

b Name an ordered pair which is *not* in the solution set of this system. [1]

38 In the following chain of equalities, each step may be justified by some algebraic property, such as the commutative property under multiplication.

Write the letters *a*, *b*, *c*, *e*, and *g* on your answer paper, and after *each* letter write the name of the algebraic property which justifies the corresponding step in the chain of equalities. [*For d and f below, the names of the algebraic properties are given.*] [10]

a $2(4x + 1) - 8x = (8x + 2) - 8x$
b $(8x + 2) - 8x = (2 + 8x) - 8x$
c $(2 + 8x) - 8x = 2 + (8x - 8x)$
d $2 + (8x - 8x) = 2 + x(8 - 8)$
....Distributive property
e $2 + x(8 - 8) = 2 + x \cdot 0$
f $2 + x \cdot 0 = 2 + 0$
....Multiplicative property of zero
g $2 + 0 = 2$

Part I Score:.....

Rater's Initials:.....

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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.....	11.....	21.....
2.....	12.....	22.....
3.....	13.....	23.....
4.....	14.....	24.....
5.....	15.....	25.....
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.

Tear Here

Tear Here

FOR TEACHERS ONLY

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SCORING KEY

NINTH YEAR MATHEMATICS

Wednesday, August 16, 1967 — 12:30 to 3:30 p.m., only

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) 18

(2) $a^2 + 3ab + 2b^2$

(3) 9

(4) -8

(5) $\frac{-4}{7}$

(6) 36

(7) $h = \frac{2S}{p}$

(8) $2x - 1$

(9) 2.6

(10) {0} *or* 0

(11) 12

(12) 3

(13) $2x + 1$

(14) 1

(15) $\frac{n - 3}{n - 1}$

(16) 53

(17) 8

(18) $x^2 - 8x - 2$

(19) 2

(20) 1

(21) 3

(22) 3

(23) 1

(24) 3

(25) 4

(26) 2

(27) 4

(28) 2

(29) 3

(30) 2

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* 117 [6]
b 71 [4]

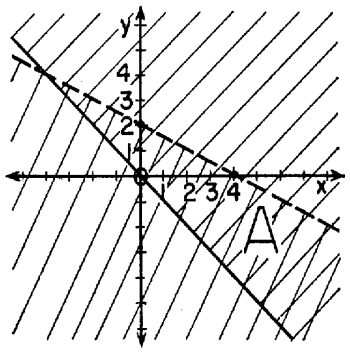
(33) *a* n = first number
$n + n + 3 + 2n - 1 = 22$ [5]
b x = number of pounds of 60¢ coffee
y = number of pounds of 78¢ coffee
$x + y = 48$
$.60x + .78y = .75(48)$ [5]

(34) Analysis [5]
20 [4]
Check [1]

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

(36) Analysis [6]
12 [3]
Check [1]

(37) *a* [9]



(38) *a* distributive property [2]

b commutative property of addition [2]

c associative property of addition [2]

e additive property of inverse numbers [2]

g additive property of zero [2]