The University of the State of New York

Centennial of Regents Examinations

1865–1965

9

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Friday, June 18, 1965—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 If the length of one side of an equilateral triangle is represented by $6a - 3b$, find the perimeter of the triangle.

2 Represent in terms of d the number of cents equal in value to d dimes.

3 What algebraic expression must be added to $3x^2 - 5$ to make the result equal to 0?

4 Find the numerical value of $x^2 + x$ when $x = \frac{1}{2}$.

5 Solve for m: $\frac{4m}{3} = \frac{m}{6} + \frac{7}{2}$

6 Solve for y: $4(y + 1) - 3(y - 3) = 25$

7 Express in simplest form the sum of $\frac{x + 1}{3}$ and $\frac{x - 1}{2}$.

8 In a certain class the ratio of the number of boys to the number of girls is 3:2. If there are 30 pupils in the class, how many of these pupils are boys?

9 Perform the indicated operations and combine like terms: $(a + b)^2 - a(a + 2b)$

10 Express the fraction $\frac{n^2 - n - 6}{4n - 12}$ in its lowest terms.

11 Find to the *nearest tenth* the value of $\sqrt{76}$.

12 Solve for x and y:

$$2x - y = 3$$
$$x + y = 3$$

13 Factor completely: $5x^2 - 45$

14 Express the product of $4x - 5$ and $3x + 4$ as a trinomial.

15 Solve for a: $.02a = 16$

16 Solve for the *positive* value of x: $\frac{1}{2}x^2 = 32$

17 In the formula $a = bc - d$, express b in terms of a, c and d.

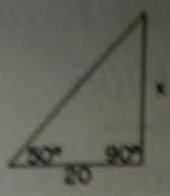
18 At the same time that a vertical 12-foot pole casts a shadow 9 feet long, a tree standing on level ground casts a shadow 60 feet long. Find the number of feet in the height of the tree.

19 At a sale, a sweater sold for $4. This amount was 80% of the original price. What was the original price?

20 The dimensions of a rectangle are 2 and 5. Express the length of a diagonal in radical form.

21 If $\sin A = .9000$, find angle A to the *nearest degree*.

22 In the accompanying figure, find the length of side x to the *nearest integer*.



Directions (23–28): 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 Which fraction lies between $\frac{1}{2}$ and $\frac{2}{3}$?

(1) $\frac{5}{6}$ (3) $\frac{7}{10}$

(2) $\frac{17}{20}$ (4) $\frac{13}{15}$

24 If $2x^2 - 3x - 8$ is divided by $x + 1$, the remainder is

(1) -9 (3) 3

(2) 0 (4) -3

25 The fraction $\frac{-6}{3 - 2a}$ is equivalent to

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

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

26 The product of $3a^2$ and $2a^3$ is

(1) $5a^5$ (3) $6a^6$

(2) $5a^6$ (4) $6a^5$

27 The points (0,3) and (1,4) lie on a straight line. An equation of this line is

(1) $y = x + 2$ (3) $y = 2x + 3$

(2) $y = x + 3$ (4) $y = 2x + 2$

28 If $\frac{x + 4}{2}$ is divided by $\frac{x^2 - 16}{8}$, the quotient is

(1) $x - 1$ (3) $\frac{1}{x - 1}$

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

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

a Given the formula $C = \frac{5}{9}[F - 32]$. Find C when $F = 50$.

OR

b Express the sum of $\sqrt{40}$ and $\sqrt{90}$ as a single term in radical form.

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

a If n represents the smallest of three consecutive integers, express the sum of the three integers in terms of n.

OR

b *On the answer sheet* construct a line perpendicular to line p from point A.

Part II

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

31 Solve graphically and check: [8, 2]

$2x - y = 5$

$x + y = -2$

32 One angle of a triangle is 12 degrees larger than a second angle. The third angle is 20 degrees less than the sum of the other two. Find the number of degrees in each angle of the triangle. [*Only an algebraic solution will be accepted.*] [6, 4]

33 Write the equation or equations that may be used in solving the following problems. In *each* case state what the letter or letters represent. [*Solution of equations is not required.*]

a The numerator of a fraction is 7 less than the denominator. If the numerator is decreased by 2 and the denominator is increased by 3, the value of the new fraction is $\frac{1}{3}$. Find the original fraction. [5]

b A storekeeper mixes peanuts worth 40 cents a pound with cashew nuts worth 90 cents a pound to obtain a mixture which is worth 75 cents a pound. How many pounds of peanuts and how many pounds of cashew nuts must be put together to obtain 100 pounds of the 75-cent mixture? [5]

34 An 18-foot ladder leans against the side of a house which stands on level ground. The foot of the ladder is 10 feet from the house.

a Find to the *nearest degree* the number of degrees in the angle which the ladder makes with the ground. [5]

b Find to the *nearest integer* the number of feet from the point where the ladder touches the house to the ground. [5]

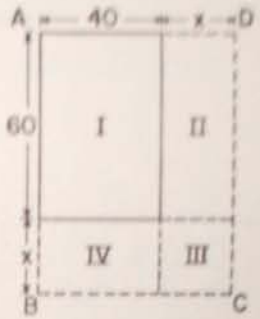
35 In an orchard 160 trees are planted in rows, the same number of trees in each row. If the number of rows is 6 less than the number of trees in a row, find the number of rows. [*Only an algebraic solution will be accepted.*] [5, 5]

36 *a* Solve for x and check:

$$12 - \frac{2x + 9}{5} = \frac{x + 3}{7} \qquad [5, 1]$$

b Show by substitution that if $x = 2\sqrt{3}$, the expression $x^2 - 2x - 2$ has the value $2(5 - 2\sqrt{3})$. [4]

37 In the accompanying diagram, the large rectangle $ABCD$ is made up of four smaller rectangles.



a Represent in terms of x

(1) the length and width of $ABCD$ [2]

(2) the area of $ABCD$ [2]

b Find the area of *each* of rectangles I, II, III and IV. [4]

c Show that the area obtained in answer to part *a* (2) above is equal to the sum of the areas of rectangles I, II, III and IV. [2]

*38 Indicate on a graph the solution set of the following system of inequalities: [4, 4, 2]

$x + y > 2$

$x - y < 5$

*39 If the blank space in each statement below is replaced by *one* of the words *addition, subtraction, multiplication* or *division*, the statement will be true. Write the letters *a* through *e* on your answer paper, and after *each* letter write the word *addition, subtraction, multiplication* or *division*, as required to make the statement true. [10]

a The set of natural numbers has the associative property under addition and ....

b In the set of integers 0 is the identity element under ....

c The set of odd integers has the property of closure under ....

d In the set of rational numbers, the commutative property is *not* valid under division and ....

e In the set of real numbers, multiplication is distributive over subtraction and ....

* 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

Friday, June 18, 1965—1:15 to 4:15 p.m., only

ANSWER SHEET

Pupil _____ Teacher _____

School _____

FOR TEACHERS ONLY

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 $x =$ _____ $y =$ _____ 20 _____

5 _____ 13 _____ 21 _____

6 _____ 14 _____ 22 _____

7 _____ 15 _____ 23 _____

8 _____ 16 _____ 24 _____

Part I Score: _____

Rater's Initials: _____

Tear Here

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

[OVER]

28. .....

26. .....

27. .....

28. .....

29 a. .....

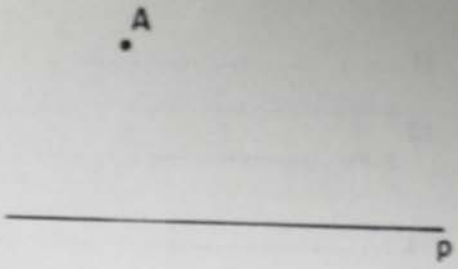
OR

b. .....

30 a. .....

OR

b



Tear Here

The University of the State of New York

Centennial of Regents Examinations

1865–1965

FOR TEACHERS ONLY

9

SCORING KEY

NINTH YEAR MATHEMATICS

Friday, June 18, 1965 — 1:15 to 4:15 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. In questions 19 and 21, allow credit if the pupil has not given the unit.

(1) $18a - 9b$

(2) $10d$

(3) $-3x^2 + 5$

(4) $\frac{3}{4}$

(5) 3

(6) 12

(7) $\frac{5x-1}{6}$

(8) 18

(9) b^2

(10) $\frac{n+2}{4}$

(11) 8.7

(12) $x = 2$, $y = 1$

(13) $5(x-3)(x+3)$

(14) $12x^2 + x - 20$

(15) 800

(16) 8

(17) $\frac{a+d}{c}$

(18) 80

(19) $5

(20) $\sqrt{29}$

(21) 64°

(22) 24

(23) 3

(24) 4

(25) 2

(26) 3

(27) 2

(28) 4

(29) *a* 10
b $5\sqrt{10}$

(30) *a* $3n + 3$

[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.

(32) Analysis [6]
44, 56, 80 [4]

(33) *a* x = numerator of given fraction

$$\frac{x-2}{x+10} = \frac{1}{3}$$

OR

n = denominator of given fraction

$$\frac{n-9}{n+3} = \frac{1}{3}$$ [5]

b x = no. lbs. of peanuts
y = no. lbs. of cashews
$x + y = 100$
$.40x + .90y = .75(100)$

OR

n = no. lbs. of peanuts
$.40n + .90(100 - n) = .75(100)$ [5]

(34) *a* 56 [5]
b 15 [5]

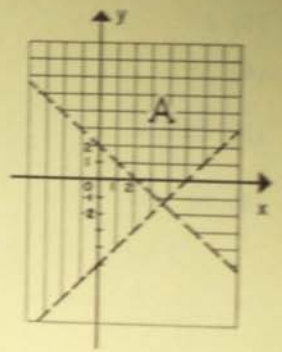
(35) Analysis [5]
10 [5]

(36) *a* 18 [5]
Check [1]

(37) *a* (1) $60 + x, 40 + x$ [2]
(2) $(60 + x)(40 + x)$ *or* $2400 + 100x + x^2$ [2]

b I $= 2400$ III $= x^2$
II $= 60x$ IV $= 40x$ [4]

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



(39) *a* multiplication [2]
b addition [2]
c multiplication [2]
d subtraction [2]
e addition [2]