The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

B

Friday, June 24, 1977 — 9:15 a.m. to 12:15 p.m., only

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.

On page 5 you will find the "Tables of Natural Trigonometric Functions" which you may need to answer some questions in this examination. Fold this page along the perforations, and tear it off also slowly and carefully.

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 all questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowe Write your answers in the spaces provided on the separate answer sheet.

1 Solve the following system of equations for x:

$$5x + y = 19$$
$$2x - y = 2$$

2 Mary can wax a car in 5 hours. What fractional part of the job can she do in one hour?

3 Divide $(8x^3 + 12x^2 - 4x)$ by $4x$.

4 Express in terms of h the number of minutes in h hours.

5 From $6y^3 + 5y^2 - 2$ subtract $4y^3 - 3y^2 - 8$.

6 If 19 is 1 more than $3x$, find x.

7 Solve for n: $.03n = 2.7$

8 Solve for y: $\frac{y + 2}{6} = \frac{7}{3}$

9 The sides of a triangle are 11, 8, and 5. If the shortest side of a similar triangle is 10, what is the longest side of the second triangle?

10 Solve for x in terms of m and t:

$$m = 3x + t$$

11 Multiply $(3x + y)$ by $(3x - y)$ and express the answer as a binomial.

12 Find the positive square root of 18 to the *nearest tenth*.

13 Factor: $x^2 + 10x + 25$

14 For what value of x is $\frac{x - 3}{x}$ undefined?

15 If each side of an equilateral triangle is $x + 6$, express the perimeter of the triangle in terms of x.

16 If the tangent of an angle is .7430, find the angle t the *nearest degree*.

17 If the replacement set for x is $\{-1,0,1\}$, find the so lution set of $3x < 2$.

18 If $x = -3$ and $y = 5$, find the value of x^2y.

19 Solve for p: $5(p - 2) = 20$

Directions (20–30): Write in the space provided on th separate answer sheet the *numeral* preceding the expres sion that best completes *each* statement or answers *each* question.

20 The product of $(-5x^2)$ and $(3x^4)$ is

(1) $-15x^8$ (3) $15x^8$
(2) $-15x^6$ (4) $15x^6$

21 The sum of $2\sqrt{3}$ and $\sqrt{12}$ is

(1) 12 (3) $3\sqrt{15}$
(2) $6\sqrt{3}$ (4) $4\sqrt{3}$

22 Which is a subset of the set $\{-3,-1,1,3\}$?

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

23 The sum of $\frac{a + 5}{a}$ and $\frac{a - 5}{5}$ is

(1) $\frac{2}{5}$ (3) $\frac{a^2 + 25}{5a}$

(2) $5 + a$ (4) $\frac{2a}{a + 5}$

24 If a, b, and c are positive integers, and $a < b$, which statement is *not* true?

(1) $b - a < 0$ (3) $ac < bc$
(2) $a - b < 0$ (4) $a + c < b + c$

25 The solution set of $x^2 - 7x + 10 = 0$ is

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

540

26 If the width of a rectangle is x meters, and the length is 5 meters more than the width, the length of the rectangle is

(1) $x - 5$ (3) $5x$

(2) $x + 5$ (4) $5 - x$

27 Rounded to the *nearest tenth*, 35.76 is

(1) 35.6 (3) 35.8

(2) 35.7 (4) 36.0

28 The value of $|8| - |-2|$ is

(1) 10 (3) -6

(2) 6 (4) -10

29 Which statement about the graph of $y = 2$ is true?

(1) It has a slope of 2.

(2) It passes through the origin.

(3) It is parallel to the x-axis.

(4) It is parallel to the y-axis.

30 If the legs of a right triangle are 5 and 7, then the hypotenuse is

(1) $\sqrt{2}$ (3) $\sqrt{24}$

(2) $\sqrt{12}$ (4) $\sqrt{74}$

☞ GO RIGHT ON TO THE NEXT PAGE.

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 Answer *either* *a* or *b*, but *not* both.

a Solve graphically and check:

$$\begin{aligned} x + y &= -1 \\ x - y &= 5 \end{aligned} \qquad [8,2]$$

OR

b On the same set of coordinate axes, graph each of the inequalities in the following system and label the solution set A:

$$\begin{aligned} y &\leq -x + 3 \\ y &> x - 4 \end{aligned} \qquad [8,2]$$

32 Solve the following system of equations algebraically and check:

$$\begin{aligned} \frac{x}{4} - \frac{y}{8} &= 2 \\ x - \frac{y}{4} &= 10 \end{aligned} \qquad [8,2]$$

33 Two cross-country runners leave a starting line at the same time and run in the same direction. The average rate of the faster runner is 10 miles per hour, and the average rate of the slower runner is 8 miles per hour.

a In how many hours will the runners be 6 miles apart? [*Only an algebraic solution will be accepted.*] [5,2]

b How many hours will the slower runner take to run 20 miles? [3]

34 Write an equation or a system of equations that 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 length of a rectangle is 7 more than the width. The perimeter of the rectangle is 50. Find the width. [5]

b Part of \$5,200 is invested at 8%, and the remainder is invested at 5%. The total annual income from these investments is \$320. Find the number of dollars invested at *each* rate. [5]

35 Answer *both* *a* and *b*.

a In right triangle ABC, angle B has a measure of 40°, and the hypotenuse AB is 21. Find the length of side AC to the *nearest integer*. [5]

b In right triangle DEF, the hypotenuse DE is 16, and side EF is 6. Find the number of degrees in the measure of angle E. [5]

36 Find three consecutive odd integers such that the product of the first integer and the third integer is 45. [*Only an algebraic solution will be accepted.*] [5,5]

37 On your answer paper write the letters *a* through *e*, and next to each letter write the *number* of the property of the real number system, *chosen from the list below*, which justifies *each* of the statements *a* through *e*. [10]

Properties

(1) Commutative property of addition
(2) Commutative property of multiplication
(3) Associative property of addition
(4) Associative property of multiplication
(5) Distributive property of multiplication over addition
(6) Transitive property of equality
(7) Addition property of equality

a $rs = sr$
b If $r = s$ and $s = t$, then $r = t$
c $r + s = s + r$
d $r(st) = (rs)t$
e If $r = s$, then $r + t = s + t$

THE UNIVERSITY OF THE STATE OF NEW YORK

THE STATE EDUCATION DEPARTMENT

BUREAU OF ELEMENTARY AND SECONDARY EDUCATIONAL TESTING

Tables of Natural Trigonometric Functions

(For use with 9th and 10th Year Mathematics Regents Examinations)

Angle	Sine	Cosine	Tangent	Angle	Sine	Cosine	Tangent
1°	.0175	.9998	.0175	46°	.7193	.6947	1.0355
2°	.0349	.9994	.0349	47°	.7314	.6820	1.0724
3°	.0523	.9986	.0524	48°	.7431	.6691	1.1106
4°	.0698	.9976	.0699	49°	.7547	.6561	1.1504
5°	.0872	.9962	.0875	50°	.7660	.6428	1.1918
6°	.1045	.9945	.1051	51°	.7771	.6293	1.2349
7°	.1219	.9925	.1228	52°	.7880	.6157	1.2799
8°	.1392	.9903	.1405	53°	.7986	.6018	1.3270
9°	.1564	.9877	.1584	54°	.8090	.5878	1.3764
10°	.1736	.9848	.1763	55°	.8192	.5736	1.4281
11°	.1908	.9816	.1944	56°	.8290	.5592	1.4826
12°	.2079	.9781	.2126	57°	.8387	.5446	1.5399
13°	.2250	.9744	.2309	58°	.8480	.5299	1.6003
14°	.2419	.9703	.2493	59°	.8572	.5150	1.6643
15°	.2588	.9659	.2679	60°	.8660	.5000	1.7321
16°	.2756	.9613	.2867	61°	.8746	.4848	1.8040
17°	.2924	.9563	.3057	62°	.8829	.4695	1.8807
18°	.3090	.9511	.3249	63°	.8910	.4540	1.9626
19°	.3256	.9455	.3443	64°	.8988	.4384	2.0503
20°	.3420	.9397	.3640	65°	.9063	.4226	2.1445
21°	.3584	.9336	.3839	66°	.9135	.4067	2.2460
22°	.3746	.9272	.4040	67°	.9205	.3907	2.3559
23°	.3907	.9205	.4245	68°	.9272	.3746	2.4751
24°	.4067	.9135	.4452	69°	.9336	.3584	2.6051
25°	.4226	.9063	.4663	70°	.9397	.3420	2.7475
26°	.4384	.8988	.4877	71°	.9455	.3256	2.9042
27°	.4540	.8910	.5095	72°	.9511	.3090	3.0777
28°	.4695	.8829	.5317	73°	.9563	.2924	3.2709
29°	.4848	.8746	.5543	74°	.9613	.2756	3.4874
30°	.5000	.8660	.5774	75°	.9659	.2588	3.7321
31°	.5150	.8572	.6009	76°	.9703	.2419	4.0108
32°	.5299	.8480	.6249	77°	.9744	.2250	4.3315
33°	.5446	.8387	.6494	78°	.9781	.2079	4.7046
34°	.5592	.8290	.6745	79°	.9816	.1908	5.1446
35°	.5736	.8192	.7002	80°	.9848	.1736	5.6713
36°	.5878	.8090	.7265	81°	.9877	.1564	6.3138
37°	.6018	.7986	.7536	82°	.9903	.1392	7.1154
38°	.6157	.7880	.7813	83°	.9925	.1219	8.1443
39°	.6293	.7771	.8098	84°	.9945	.1045	9.5144
40°	.6428	.7660	.8391	85°	.9962	.0872	11.4301
41°	.6561	.7547	.8693	86°	.9976	.0698	14.3007
42°	.6691	.7431	.9004	87°	.9986	.0523	19.0811
43°	.6820	.7314	.9325	88°	.9994	.0349	28.6363
44°	.6947	.7193	.9657	89°	.9998	.0175	57.2900
45°	.7071	.7071	1.0000	90°	1.0000	.0000	

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Friday, June 24, 1977 — 9:15 a.m. to 12:15 p.m., only

B

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

ANSWER SHEET

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

School ..... Grade .....

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.

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

FOR TEACHERS ONLY

SCORING KEY

9 NINTH YEAR MATHEMATICS B

Friday, June 24, 1977 — 9:15 a.m. to 12:15 p.m., only

Use only *red* ink or *red* 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. For questions 20–30, allow credit if the pupil has written the correct answer instead of the number 1, 2, 3, or 4.

(1) 3

(2) $\frac{1}{5}$

(3) $2x^2 + 3x - 1$

(4) $60h$

(5) $2y^3 + 8y^2 + 6$

(6) 6

(7) 90

(8) 12

(9) 22

(10) $\frac{m - t}{3}$

(11) $9x^2 - y^2$

(12) 4.2

(13) $(x + 5)(x + 5)$

(14) 0

(15) $3x + 18$

(16) 37

(17) $-1,0$

(18) 45

(19) 6

(20) 2

(21) 4

(22) 4

(23) 3

(24) 1

(25) 4

(26) 2

(27) 3

(28) 2

(29) 3

(30) 4

[OVER]

547

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 $x = 12$

$y = 8$ [8]

Check [2]

33 *a* Analysis [5]

3 [2]

b $2\frac{1}{2}$ [3]

34 *a* x = width of rectangle

$2x + 2(x + 7) = 50$ [5]

b x = number of dollars invested at 5%

$.05x + .08(5200 - x) = 320$ [5]

35 *a* 13 [5]

b 68 [5]

36 Analysis [5]

(5,7,9) or (−9,−7,−5) [5]

37 *a* 2 [2]

b 6 [2]

c 1 [2]

d 4 [2]

e 7 [2]