The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Friday, June 20, 1986—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 allowed. Write your answers in the spaces provided on the separate answer sheet. [60]

1 What is the sum of $2c + 3d$ and c?

2 Solve for x: $2(x - 4) = 20$

3 Solve for d: $0.04d - 4 = 8$

4 What is the product of $7y^3$ and $4y^5$?

5 Solve for y in terms of a and b:

$$a + 2y = b$$

6 What is the value of $\frac{3}{4}(6x + 2)$ when $x = 5$?

7 If $\cos x = 0.9341$, find the measure of angle x to the *nearest degree.*

8 Factor: $x^2 - 5x - 6$

9 Solve the following system of equations for x:

$$6x + 2y = 14$$
$$3x + 2y = 8$$

10 Find the value of $\sqrt{27}$ to the *nearest tenth.*

11 If the point $(2,r)$ lies on the graph of the equation $3x + 2y = 12$, find the value of r.

12 On a map, 2 centimeters represents 100 kilometers. How many centimeters will represent 450 kilometers?

13 If x represents a certain number, express 2 less than 7 times the number in terms of x.

14 Perform the indicated operation and express the answer in *lowest terms*:

$$\frac{x - 1}{3} \div \frac{2x - 2}{5}$$

15 Solve for t: $\frac{t}{6} - \frac{t}{8} = 2$

16 Find the positive root of the equation $6x^2 = 54$.

Directions (17 – 30): Write in the space provided on the separate answer sheet the *numeral* preceding the expression that best completes *each* statement or answers *each* question.

17 The expression $\frac{18x^3y^2}{-3x^3y}$ is equivalent to

(1) $6xy$ (3) $-6xy^2$
(2) $-6xy$ (4) $-6y$

18 The sum of two numbers is 16. If the smaller number is represented by x, then the larger number may be represented by

(1) $16 - x$ (3) $16 + x$
(2) $x - 16$ (4) $16x$

19 A member of the solution set of $3x - 2 > 10$ is

(1) 0 (3) -4
(2) 5 (4) 4

20 What is the additive inverse of -4?

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

21 If $ab = 0$ and $a > 0$, then

(1) $b < 0$ (3) $b = 0$
(2) $b > 0$ (4) $b = a$

22 The solution set for $|x + 1| = 5$ is

(1) $\{-4,-6\}$ (3) $\{4,-6\}$
(2) $\{-4,6\}$ (4) $\{4,6\}$

23 An equation of the line parallel to the x-axis and 1 unit below it is

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

24 Brian can mow the lawn in 3 hours. What part of the lawn can he mow in x hours?

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

(2) $\frac{1}{3x}$ (4) $3x$

25 If the length of the hypotenuse of a right triangle is 11 and the length of one leg is 8, what is the length of the other leg?

(1) $\sqrt{57}$ (3) $\sqrt{3}$

(2) $\sqrt{185}$ (4) $\sqrt{19}$

26 The sum of $4\sqrt{3}$ and $\sqrt{75}$ is

(1) $4\sqrt{78}$ (3) $5\sqrt{78}$

(2) $9\sqrt{3}$ (4) $9\sqrt{6}$

27 An item which normally sells for \$80 is on sale at a 20% discount. The sale price of the item is

(1) \$100 (3) \$60

(2) \$16 (4) \$64

28 If the area of a square is 64, what is the perimeter?

(1) 16 (3) 64

(2) 32 (4) 256

29 The angles of a triangle are in the ratio 2:3:4. What is the measure of the *largest* angle?

(1) 10° (3) 80°

(2) 20° (4) 40°

30 What is the slope of the line whose equation is $2y = 3x + 6$?

(1) $\frac{2}{3}$ (3) 3

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

☞ 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. [40]

31 On the same set of coordinate axes, graph the following system of inequalities and label the solution set A.

$$\begin{aligned} 2x + y &\geq 1 \\ y &< x - 2 \end{aligned}$$ [8,2]

32 Answer *both* a and b.

a Perform the indicated operation and express the result in *lowest terms*:

$$\frac{x^2 - 9}{x} \cdot \frac{x^2 + 2x}{x^2 + 5x + 6}$$ [4]

b Solve for n and check:

$$\frac{n + 6}{3} - \frac{n - 2}{2} = 2$$ [5,1]

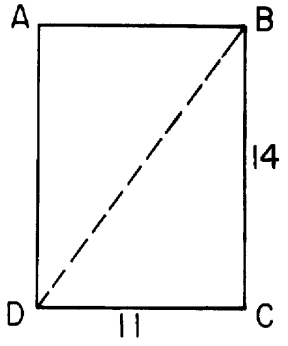
33 Solve algebraically and check:

$$\begin{aligned} 2x + y &= 6 \\ x &= 3y + 10 \end{aligned}$$ [8,2]

34 The measure of the largest angle of a triangle is four times the measure of the smallest angle. The measure of the remaining angle is 36 degrees less than the measure of the largest angle. Find the number of degrees in the measure of *each* angle of the triangle. [*Only an algebraic solution will be accepted.*] [5,5]

35 Pat invests part of $10,000 at 8% interest and the remainder at 6% interest. If the total annual income from both investments is $720, find the number of dollars invested at *each* rate. [*Only an algebraic solution will be accepted.*] [5,5]

36 In the accompanying diagram of rectangle $ABCD$, the length of $\overline{DC}$ is 11 and the length of $\overline{BC}$ is 14.



a Find, to the *nearest degree*, the measure of angle BDC. [5]

b Find, to the *nearest integer*, the length of diagonal $\overline{BD}$. [5]

37 The replacement set for x for each of the open sentences below is $\{-4,-3,-2,-1,0,1,2,3,4\}$. On your answer paper, write the letters a through e, and next to *each* letter, write the solution set of the open sentence. [*Each answer must be a subset of the replacement set.*] [10]

a $2x + 2 = 4x + 6$

b $-2x < -6$

c $x^2 = 9$

d $|x| + 1 = 5$

e $6 + x = 6$

THE UNIVERSITY OF THE STATE OF NEW YORK

THE STATE EDUCATION DEPARTMENT

DIVISION OF 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	

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REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Friday, June 20, 1986—9:15 a.m. to 12:15 p.m., only

Part I Score	
Part II Score	
Total 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

9

SCORING KEY

NINTH YEAR MATHEMATICS

Friday, June 20, 1986—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 17 – 30, allow credit if the pupil has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) $3c + 3d$

(2) 14

(3) 300

(4) $28y^8$

(5) $\frac{b-a}{2}$

(6) 24

(7) 21

(8) $(x - 6)(x + 1)$

(9) 2

(10) 5.2

(11) 3

(12) 9

(13) $7x - 2$

(14) $\frac{5}{6}$

(15) 48

(16) 3

(17) 4

(18) 1

(19) 2

(20) 4

(21) 3

(22) 3

(23) 2

(24) 1

(25) 1

(26) 2

(27) 4

(28) 2

(29) 3

(30) 2

Part II

Please refer to the Department's pamphlet *Guide for Rating Regents Examinations 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* $x - 3$ [4]
b 6 [5]
Check [1]

(33) $x = 4$
$y = -2$ [8]
Check [2]

(34) Analysis [5]
24, 60, 96 [5]

(35) Analysis [5]
$6,000 at 8%
$4,000 at 6% [5]

(36) *a* 52 [5]
b 18 [5]

(37) *a* −2 [2]
b 4 [2]
c −3, 3 [1,1]
d −4, 4 [1,1]
e 0 [2]

As a reminder . . .

Regents examinations based on the Ninth Year Mathematics syllabus will not be offered after January 1988.