The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Friday, April 11, 1975—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.

1 What is the additive inverse of -5?

2 Solve for x: $5x + 8 = 53$

3 Solve for n: $7n - 2(n + 1) = 13$

4 Solve for x: $\frac{5}{3} = \frac{20}{x}$

5 Solve for x: $.05x = .35$

6 Solve for x in terms of a, b, and c: $ax + b = c$

7 Find the value of $|-5| - |3|$.

8 From $2n^2 + 2n + 7$ subtract $n^2 + 3n - 8$.

9 On a scale drawing, 1 inch represents 32 feet. A measurement of 4 inches on the drawing represents how many feet?

10 Find the value of $(5x)^3$ if $x = -2$.

11 If 2% of a number is 8, what is the number?

12 What is the *negative* root of $x^2 - 16 = 0$?

13 Express $\frac{7x}{3} + \frac{2x}{5}$ as a single fraction.

14 Two numbers are in the ratio 1 : 7 and their sum is 40. What is the *smaller* number?

15 Express the product $(2x - 1)(x + 2)$ as a trinomial.

16 Solve the following system of equations for x:

$$2x + 3y = 5$$
$$x + 3y = 1$$

17 Express the fraction $\frac{n^2 + 4n - 21}{n + 7}$ in *simplest form.*

18 Find the value of $\sqrt{42}$ to the *nearest tenth.*

19 Factor completely:

$$3ab + 15a$$

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

20 If x represents a number, then the average of $2x$ and $-x$ is

(1) 1 (3) x

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

21 Which values of x satisfy the open sentence $4x - 2 > 10$?

(1) $x < 2$ (3) $x > 2$

(2) $x < 3$ (4) $x > 3$

22 An airplane flew for h hours at an average speed of 200 miles per hour. It then flew for q hours at an average speed of 300 miles per hour. Which expression represents the total distance flown by the airplane?

(1) $500hq$

(2) $\frac{500}{(h + q)}$

(3) $(200 + 300)(h + q)$

(4) $200h + 300q$

23 What is the slope of the graph of the equation $y = -\frac{1}{2}x + 7$?

(1) $\frac{1}{2}$ (3) 7

(2) $-\frac{1}{2}$ (4) -7

24 The prime factorization of 72 is

(1) $2^3 \times 3^2$ (3) 8×3^2

(2) 2×6^2 (4) $2^2 \times 18$

25 The expression $3x^2(x^3 + x^2)$ is equivalent to

(1) $6x^7$ (3) $3x^5 + 3x^4$

(2) $3x^{10}$ (4) $3x^6 + 3x^4$

26 The sum of $3\sqrt{2}$ and $\sqrt{8}$ is

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

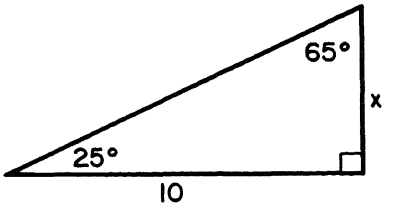
(2) $7\sqrt{2}$ (4) $4\sqrt{10}$

27 Which point is on the graph of the equation $x + 2y = 1$?

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

(2) $(0, \frac{1}{2})$ (4) $(0,1)$

28 Which equation can be used to find the value of x in the right triangle shown in the accompanying diagram?



(1) $\sin 25° = \frac{x}{10}$ (3) $\tan 25° = \frac{x}{10}$

(2) $\cos 25° = \frac{x}{10}$ (4) $\tan 65° = \frac{x}{10}$

29 If the area of a square is 36 square inches, what is the number of inches in the *perimeter* of the square?

(1) 6 (3) 24

(2) 12 (4) 36

30 If x is an integer, what is the solution set for $-3 < x \leq 2$?

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

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

☞ **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:

$$2x + y = 8$$
$$y = x + 2 \qquad [8,2]$$

OR

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

$$y \geqq 2x + 1$$
$$y < 3 \qquad [8,2]$$

32 Answer *both a* and *b*.

a Multiply and express in *simplest form*:

$$\frac{x^2 + 3x}{x^2 - 9} \cdot \frac{x - 3}{x} \qquad [4]$$

b Solve and check:

$$\frac{3x + 1}{2} - \frac{2x - 3}{3} = 4 \qquad [5,1]$$

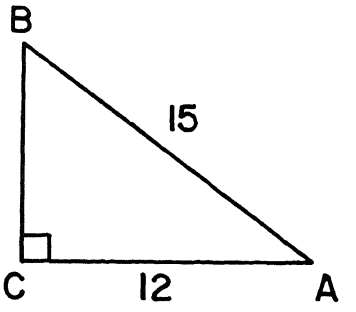
33 A person invested \$6,000, some at 7% and the rest at 5%. The income from the 7% investment is equal to the income from the 5% investment. Find the number of dollars invested at *each* rate. [*Only an algebraic solution will be accepted.*] [5,5]

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 sum of the digits of a two-digit number is 9. The number is equal to 12 times the tens digit. Find the number. [5]

b A positive integer is 4 more than 5 times its reciprocal. Find the integer. [5]

35 In right triangle ABC shown in the accompanying diagram, angle C is a right angle, $AB = 15$, and $AC = 12$.



a Find BC. [3]

b Express $\cos A$ as a fraction. [2]

c Find the measure of angle A to the *nearest degree*. [3]

d Find the measure of angle B to the *nearest degree*. [2]

36 The width and the length of a rectangle are consecutive even integers. The area of the rectangle is 48. Find the length and width of the rectangle. [*Only an algebraic solution will be accepted.*] [5,5]

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

a $(x - 1)(x + 2) = 0$

b $|x| = 1$

c $x^2 + 4 = 4$

d $2(x + 1) = 2x + 2$

e $2x + 1 = 4$

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	

FOR TEACHERS ONLY

9 NINTH YEAR MATHEMATICS

Friday, April 11, 1975 — 9:15 a.m. to 12:15 p.m., only

Just before the start of the examination period, distribute one examination booklet, face up, to each pupil. Instruct the pupils to read the directions on the cover of the examination booklet, detach the answer sheet and reference tables, and fill in the heading on their answer sheet. Remind the pupils to sign the declaration printed at the end of the answer paper when they have finished the examination. When each pupil has received a booklet and finished filling in the heading of the answer sheet, instruct the pupils to open their examination booklets and begin work.

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.

SCORING KEY

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) 5

(2) 9

(3) 3

(4) 12

(5) 7

(6) $\frac{c - b}{a}$

(7) 2

(8) $n^2 - n + 15$

(9) 128

(10) —1,000

(11) 400

(12) —4

(13) $\frac{41x}{15}$

(14) 5

(15) $2x^2 + 3x - 2$

(16) 4

(17) $n - 3$

(18) 6.5

(19) $3a(b + 5)$

(20) 4

(21) 4

(22) 4

(23) 2

(24) 1

(25) 3

(26) 1

(27) 2

(28) 3

(29) 3

(30) 2

[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) *a* 1 [4]

b 3 [5]

Check [1]

(33) Analysis [5]

\$2,500 @ 7%
\$3,500 @ 5% [5]

(34) *a* Let t = tens digit
u = units digit

$t + u = 9$
$10t + u = 12t$ [5]

b Let x = an integer

$x = 5\left(\frac{1}{x}\right) + 4$ [5]

(35) *a* 9 [3]

b $\frac{12}{15}$ [2]

c 37° [3]

d 53° [2]

(36) Analysis [5]

6, 8 [5]

(37) *a* {1,—2} [1,1]

b {1,—1} [1,1]

c {0} [2]

d {—2,—1,0,1,2} [2]

e { } [2]