The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Thursday, January 24, 1974 — 1:15 to 4:15 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.

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 Using the relation $A = \frac{1}{2}bh$, find A if $b = 4$ and $h = 5$.

2 Solve for n: $2n + 3 = 5n - 9$

3 Find the solution set of $.06x = 54$.

4 What is the solution set for $x^2 - 49 = 0$ if the replacement set is the set of *negative* integers?

5 Solve for x: $3(x + 1) = 2x$

6 Solve this system of equations for x:

$$2x + y = 5$$
$$x + y = 2$$

7 Find *one* integer in the solution set of

$$\frac{x}{3} + 4 > 6.$$

8 Express as a trinomial: $(3a + 5)(2a - 3)$

9 Find the value of $|-2| + |7| - |-5|$.

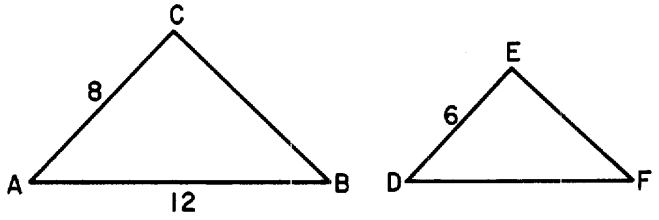
10 If n represents an even integer, express the next larger even integer in terms of n.

11 Solve for x in terms of a, b, and c: $cx + a = b$

12 The equation $(x - 2)(x - b) = 0$ has the solution set $\{2,3\}$. What is the value of b?

13 Find the value of $\sqrt{52}$ to the *nearest tenth*.

14 In the accompanying diagram, triangle ABC is similar to triangle DFE ($\angle A = \angle D$, $\angle B = \angle F$). If $AC = 8$, $AB = 12$, and $DE = 6$, find the length of DF.



15 Express $\frac{a + b}{2} + \frac{2b}{3}$ as a single fraction.

16 Write an algebraic expression to represent the total number of cents in q quarters and d dimes.

17 From $9y^2 - 2y - 5$ subtract $7y^2 + 3y - 8$.

18 Factor: $x^2 - 9x + 14$

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

19 Which is an illustration of the associative property of addition?

(1) $4 + 6 = 6 + 4$
(2) $4(6 + 3) = 4(6) + 4(3)$
(3) $6 + 0 = 6$
(4) $(4 + 6) + 3 = 4 + (6 + 3)$

20 The expression $3(x + y) + 2(x + 3y)$ is equivalent to

(1) $5(2x + 4y)$
(2) $5x + 4y$
(3) $5x + 8y$
(4) $5x + 9y$

21 If 50% of a number is 20, then 75% of the same number would be

(1) $7\frac{1}{2}$
(2) 15
(3) 30
(4) 40

22 Which value of y will make the fraction $\frac{y + 2}{y - 5}$ meaningless?

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

23 The expression $\frac{15 - 50}{-5}$ is equivalent to

(1) -53
(2) -7
(3) 7
(4) 13

24 The product of $5x$ and $(3x)^2$ is

(1) $30x^2$
(2) $15x^3$
(3) $45x^3$
(4) $225x^4$

25 If $x = 10(\sin 40°)$, the value of x to the *nearest hundredth* is

(1) .64
(2) .77
(3) 6.43
(4) 7.66

26 If $A = \{1,2,3,4\}$, which set is *not* a subset of A?

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

27 The side of a square is represented by $a - 2b$. An expression for the perimeter of this square is

(1) $2a - 4b$
(2) $4a - 2b$
(3) $4a - 8b$
(4) $(a - 2b)^2$

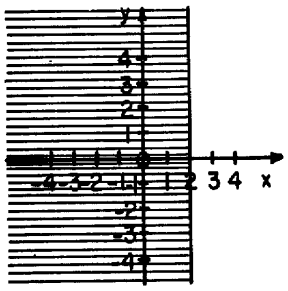
28 The expression $5\sqrt{2} - \sqrt{32}$ is equivalent to

(1) $-11\sqrt{2}$
(2) $\sqrt{2}$
(3) $9\sqrt{2}$
(4) $\sqrt{18}$

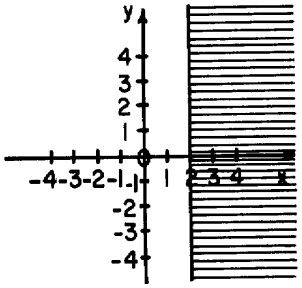
29 Which point is on the graph of $3x - 2y = 7$?

(1) (1,—2)
(2) (2,—1)
(3) (3,2)
(4) (0,—3)

30 Which is the graph of $y \leq 2$?



(1)



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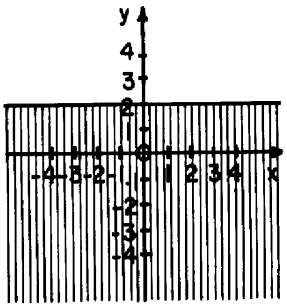

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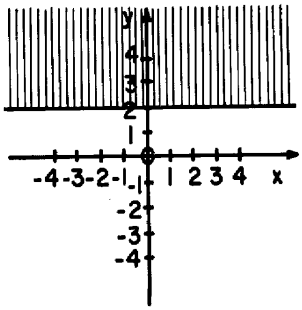


(4)

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: [10]

$$2x + y = 8$$
$$y = x + 2$$

32 *a* Perform the indicated operation and express your answer as a single fraction in *lowest terms*: [4]

$$\left(\frac{x^2 - 9}{2x - 6}\right)\left(\frac{1}{x + 3}\right)$$

b Solve for x: [6]

$$x - 2 = \frac{3}{x}$$

33 A sum of $3,500 is invested in two parts. One part earns interest at 5% and the other at 8%. The total annual interest is $250. Find the amount invested at *each* rate. [*Only an algebraic solution will be accepted.*] [5,5]

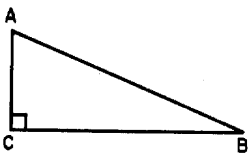
34 Write an equation or a system of equations that can be used to solve *each* of the following problems. In each case state what the variable or variables represent. [*Solution of the equations is not required.*]

a The sum of three consecutive integers is 90. Find the integers. [5]

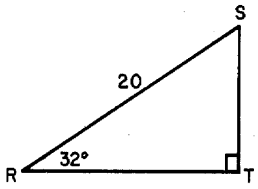
b The length of a rectangle exceeds its width by three inches. If the area of the rectangle is 40 square inches, find the measures of its length and width. [5]

35 The difference between two numbers is 1. The sum of three times the larger and twice the smaller is 13. Find the numbers. [*Only an algebraic solution will be accepted.*] [5,5]

36 *a* In the right triangle ABC, the measures of legs AC and BC are in the ratio 2:5. Find the measure of angle B to the *nearest degree*. [5]



b In the accompanying diagram, right triangle RST has its right angle at T. The measure of RS is 20 and the measure of angle R is 32°. Find the measure of ST to the *nearest integer*. [5]



37 Write the letters *a* through *e* on your answer paper. Then, for *each* incomplete sentence in *a* through *e* below, write the *numeral* preceding the name of the set, *chosen from the list below*, which best completes that sentence. [10]

Names of Sets

(1) Positive integers
(2) Rational numbers
(3) Irrational numbers

a The set which contains all the natural numbers and does *not* contain the member $\frac{1}{2}$ is the set of

b The set which contains the member $\sqrt{2}$ is the set of

c The set which contains the solution of the equation $3x + 12 = 0$ is the set of

d The set which contains the solution of the equation $4x = 3$ is the set of

e The set which has a smallest member is the set of

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	

Tear Here

Part I Score:.....

Rater's Initials:

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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Thursday, January 24, 1974 — 1:15 to 4:15 p.m., only

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.

Tear Here

FOR TEACHERS ONLY

9 NINTH YEAR MATHEMATICS

Thursday, January 24, 1974 — 1:15 to 4:15 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. 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 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 19–30, allow credit if the pupil has written the correct answer instead of the number 1, 2, 3, or 4.

(1) 10

(2) 4

(3) 900 *or* {900}

(4) —7 *or* {—7}

(5) —3

(6) 3

(7) any integer greater than 6

(8) $6a^2 + a - 15$

(9) 4

(10) $n + 2$

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

(12) 3

(13) 7.2

(14) 9

(15) $\frac{3a + 7b}{6}$

(16) $25q + 10d$

(17) $2y^2 - 5y + 3$

(18) $(x - 7)(x - 2)$

(19) 4

(20) 4

(21) 3

(22) 1

(23) 3

(24) 3

(25) 3

(26) 1

(27) 3

(28) 2

(29) 1

(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* ½ [4]
b 3, —1 [6]

(33) Analysis [5]
$1,000 @ 5%
$2,500 @ 8% [5]

(34) *a* let x = smallest of three integers
$x + x + 1 + x + 2 = 90$ [5]
b let x = width of the rectangle
$x(x + 3) = 40$ [5]

(35) Analysis [5]
2, 3 [5]

(36) *a* 22 [5]
b 11 [5]

(37) *a* 1 [2]
b 3 [2]
c 2 [2]
d 2 [2]
e 1 [2]

DO YOU KNOW...

... that practically all objective questions used on the Regents examinations have been "pretested" on a representative sample of students in New York State schools?

Over 6,000 questions in 16 subject areas were tried out in May 1972. These questions were assembled into 267 pretest forms that could be administered in a single classroom period. Some 53,000 students in 355 schools throughout New York State participated in this pretesting of questions for possible use in future Regents examinations.