The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR

MATHEMATICS

Tuesday, June 20, 1972 — 9:15 a.m. to 12:15 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. On page 5, which is perforated, you will find the "Tables of Natural Trigonometric Functions" which you will need to answer some questions in this examination. Fold this page along the perforation, and tear it off. When you have torn off these two pages and finished the heading, you may begin the examination immediately.

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 Find the value of ab^2 when $a = 3$ and $b = -2$.

2 If 3 times a number is subtracted from 7 times the same number, the result is 12. What is the number?

3 Find the solution set for the equation $-4y + 30 = 50$.

4 What is the solution set of the equation
$$5x - 4 = 3(x + 2)?$$

5 Solve for y: $\frac{3}{4}y + 5 = 17$

6 If n represents an odd integer, express the next larger *odd* integer in terms of n.

7 What is the multiplicative inverse of $\frac{1}{3}$?

8 Express the sum of the fractions $\dfrac{x}{6}$ and $\dfrac{x}{5}$ as a single fraction.

9 Factor: $x^2 - 36$

10 Solve for x in terms of a, b, and c: $\dfrac{ax}{c} = b$

11 What is the measure of angle A to the *nearest degree*, if $\sin A = .9513$?

12 Find the value of $\sqrt{17}$ to the *nearest tenth*.

13 A boy takes 3 minutes to read a story of 315 words. How many minutes will it take him to read a story of 945 words at the same rate?

14 The sum of two binomials is $3x^2 - 5x$. If one of the binomials is $2x^2 - x$, what is the other?

15 The width of a rectangle is represented by $2a$ and the length by $3a - 2$. Represent the perimeter of this rectangle in terms of a.

16 If $x + y = x$, what is the numerical value of xy?

17 The sum of two angles is $90°$. If the angles are in the ratio $1:4$, what is the number of degrees in the smaller angle?

18 What is the slope of the graph of $y = -3x + 11$?

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 The product of $3x^5$ and $5x^3$ is
(1) $15x^8$ (3) $15x^{15}$
(2) $8x^{15}$ (4) $8x^8$

20 The fraction $\dfrac{x^2 + 2x - 8}{x - 2}$ is equivalent to
(1) $3x + 4$ (3) $x - 4$
(2) $\dfrac{(x - 4)(x + 2)}{(x - 2)}$ (4) $x + 4$

21 The average of a, b, c, and d is
(1) $a + b + c + \dfrac{d}{4}$

(2) $\dfrac{a + b + c + d}{4}$

(3) $\dfrac{4a + 4b + 4c + 4d}{4}$

(4) $4(a + b + c + d)$

22 Which ordered pair is a solution of the following system of equations?
$$x + y = 5$$
$$x - y = -1$$
(1) $(2,-3)$ (3) $(3,-2)$
(2) $(2,3)$ (4) $(3,2)$

23 If the yearly income from an investment is $35 and the annual interest rate is 5%, then the original investment is
(1) $70   (3) $700
(2) $350   (4) $175

24 The value of $|-10| - |-4|$ is
(1) -14 (3) 6
(2) -6 (4) 14

25 If x is an integer, the solution set of $5 < x \leqq 6$ is
   (1) {6}   (3) {5,6}
   (2) {5}   (4) ϕ

26 If the replacement set is the set of negative numbers, then the solution set of $\frac{1}{3}x^2 = 27$ is
   (1) {—40.5}   (3) {—3}
   (2) {—9}   (4) {—3$\sqrt{3}$}

27 When $2\sqrt{3}$ is added to $\sqrt{27}$ the sum is
   (1) $2\sqrt{30}$ (3) $5\sqrt{6}$
   (2) $\sqrt{39}$ (4) $5\sqrt{3}$

28 The graph of $3x - y = 6$ passes through the point
   (1) (1,7)   (3) (6,—6)
   (2) (5,9)   (4) (4,—6)

29 If one of the legs of a right triangle is 3 and the other leg is 5, then the length of the hypotenuse is
   (1) $\sqrt{34}$ (3) $\sqrt{8}$
   (2) 34   (4) 8

30 The accompanying graph indicates the solution set of which open sentence?

   (1) $x \leqq 0$ (3) $x < 0$
   (2) $x > 0$ (4) $x \geqq 0$

Part II

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

31 Solve graphically and check: [8,2]

$$2x + y = 10$$
$$x - y = 2$$

32 Solve the following system of equations, and check: [8,2]

$$2x + 3y = -4$$
$$5x + 2y = 1$$

33 If the square of a positive number is added to 5 times this number, the result is 36. Find the number. [*Only an algebraic solution will be accepted.*]   [5,5]

34 Write an equation or system of equations which 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 In a two-digit number the tens digit is 5 greater than the units digit. The number is 63 greater than the sum of its digits. Find the number.   [5]

b A boy can wax a car in 6 hours alone while his friend can do the same job in 4 hours alone. How many hours would it take the two boys working together?   [5]

35 On your answer paper write the letters *a* through *e*, and after each letter write the *numeral* that makes the correspondingly lettered statement correct.   [10]
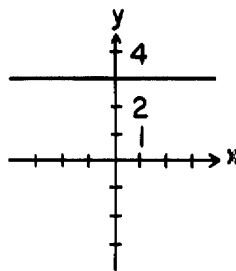
a The graph shown is the graph of

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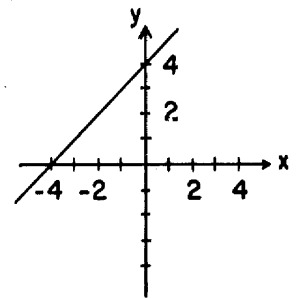
(2) $y = -x$

(3) $y = |x|$

(4) $y = 2x$
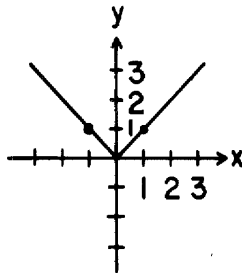
b The graph shown is the graph of
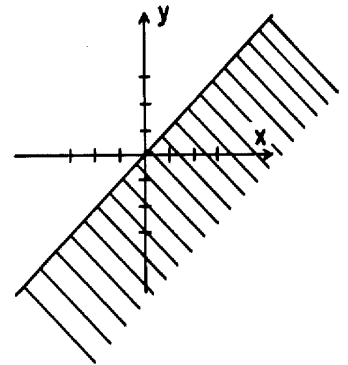
(1) $x = 3$

(2) $x = -3$

(3) $y = 3$

(4) $y = -3$

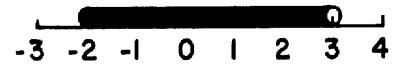*c* The graph shown has a slope of

(1) 1

(2) -1

(3) -4

(4) 4

d The graph shown is the graph of

(1) $y > x$

(2) $y < x$

(3) $y \geqq x$

(4) $y \leqq x$

e The graph shown is the graph of which inequality?

(1) $-2 < x < 3$ (3) $-2 \leqq x \leqq 3$
(2) $-2 \leqq x < 3$ (4) $-2 < x \leqq 3$

36 In the accompanying diagram, right triangle *ABC* has its right angle at *C*. The measure of $\overline{BC}$ is 20 and the measure of angle *B* is 42°.
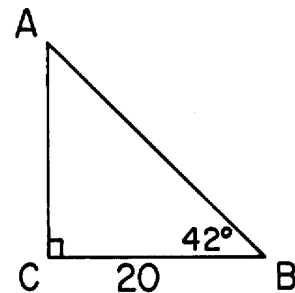
a Find the measure of *AC* to the *nearest integer*.   [5]
b Find the measure of *AB* to the *nearest integer*.   [5]

37 A man mixes peanuts selling at 40¢ a pound with cashew nuts selling at 70¢ a pound to make a 50-pound mixture which he sells at 52¢ a pound. How many pounds of each kind of nuts must he mix? [*Only an algebraic solution will be accepted.*]   [5,5]

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

Tuesday, June 20, 1972 — 9:15 a.m. to 12:15 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.

FOR TEACHERS ONLY

9

SCORING KEY
NINTH YEAR MATHEMATICS

Tuesday, June 20, 1972 — 9:15 a.m. to 12:15 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. For questions 19–30, allow credit if the pupil has written the correct answer instead of the number 1, 2, 3, or 4.

(1) 12	(11) 72	(21) 2
(2) 3	(12) 4.1	(22) 2
(3) —5	(13) 9	(23) 3
(4) 5	(14) $x^2 - 4x$	(24) 3
(5) 16	(15) $10a - 4$ (*or* many variations)	(25) 1
(6) $n + 2$	(16) 0	(26) 2
(7) 3	(17) 18	(27) 4
(8) $\dfrac{11x}{30}$ *or* $\dfrac{5x + 6x}{30}$	(18) —3	(28) 2
(9) $(x - 6)(x + 6)$	(19) 1	(29) 1
(10) $\dfrac{bc}{a}$	(20) 4	(30) 1

[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) $x = 1$
      $y = -2$ [8]
      Check [2]

(33) Analysis [5]
      4 [5]

(34) a $t =$ tens digit
      $u =$ units digit
      $t = u + 5$
      $10t + u = t + u + 63$ [5]

   b $x =$ no. of hrs. worked together

   $$\frac{x}{6} + \frac{x}{4} = 1 \qquad [5]$$

(35) a 3 [2]
      b 3 [2]
      c 1 [2]
      d 4 [2]
      e 2 [2]

(36) a 18 [5]
      b 27 [5]

(37) Analysis [5]
      30 pounds of peanuts
      20 pounds of cashews [5]

DO YOU KNOW . . .

Who writes the questions used on Regents examinations?

1 the members of the Board of Regents
2 the subject supervisors in the State Education Department
3 college professors in the various disciplines
4 classroom teachers from schools throughout New York State

The correct answer is 4. Last year more than 400 classroom teachers were involved in the preparation of Regents examination questions, and many other teachers served on the committee that assembled the examinations.