

REGENTS HIGH SCHOOL EXAMINATION
NINTH YEAR MATHEMATICS

Monday, June 19, 1967 — 1:15 to 4:15 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. When you have finished the heading, you may begin the examination immediately.

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 Factor: $36 - x^2$
 - 2 Subtract $5x^2 - 3x - 2$ from $8x^2 + 3x - 4$.
 - 3 Find the value of $|7| + |-7|$.
 - 4 Solve for x : $(x + 1)^2 - x^2 = 21$
 - 5 Find the solution set for $6x - 3(x - 4) = 9$.
 - 6 Find the solution set for $\frac{x - 1}{3} = \frac{x + 2}{6}$.
 - 7 Find the slope of the graph of the equation $y - 2x = 7$.
 - 8 A television set was on sale for \$120, which was 75% of the regular price. What was the regular price?
 - 9 Find the solution set for $x^2 + 4x - 12 = 0$ if the domain for x is the set of *positive* integers.
 - 10 Divide $(18y^3 - 12y^2 + 6y)$ by $6y$.
 - 11 Express as a binomial the average of $7n + 5$ and $3n - 13$.
 - 12 If $x = 3y$, what is the value of $\frac{x}{y}$?
 - 13 Express as a single fraction in lowest terms:
 $\frac{3a - 2b}{4} - \frac{a}{2}$
 - 14 A vertical pole standing on level ground casts a shadow 8 feet long at the same time that another vertical pole 12 feet high casts a shadow 3 feet long. What is the number of feet in the height of the first pole?
 - 15 If the base of a rectangle is represented by $4x - 7$ and its altitude by $3x + 5$, represent its area as a trinomial in terms of x .
 - 16 Find the positive square root of 38 to the *nearest tenth*.
 - 17 Find one integer in the solution set of $5x - 2 < 8$.
- Directions (18–30):* Write in the space provided on the separate answer sheet the *number* preceding the expression that best completes *each* statement or answers *each* question.
- 18 Which is an example of the associative law for addition?
 - (1) $2 + 3 = 3 + 2$
 - (2) $2 + 0 = 2$
 - (3) $(2 + 3) + 4 = 2 + (3 + 4)$
 - (4) $2(3 + 4) = 2 \cdot 3 + 2 \cdot 4$
 - 19 The sum of $2\sqrt{3}$ and $\sqrt{27}$ is

(1) $4\sqrt{3}$	(3) $11\sqrt{3}$
(2) $5\sqrt{3}$	(4) $3\sqrt{30}$
 - 20 What is the solution set of the following system of equations:

$$\begin{aligned} 2x + y &= 7 \\ x - 2y &= 6 \end{aligned}$$

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

- 21 Which statement concerning the set of positive integers is true?
 (1) It is closed under addition.
 (2) It has an additive identity element.
 (3) It has an additive inverse for each element in the set.
 (4) It has a multiplicative inverse for each element in the set.
- 22 When $n^2 + 7n - 9$ is divided by $n + 1$, the remainder is
 (1) 1
 (2) -15
 (3) 3
 (4) -3
- 23 Jack has 3 more cards than Bill. Together they have 47 cards. If x represents the number of cards Bill has, then an equation which can be used to determine the number of cards each boy has is
 (1) $x + 3 = 47$
 (2) $x - 3 = 47$
 (3) $x + 3x = 47$
 (4) $2x + 3 = 47$
- 24 When $ab + c = 2$ is solved for a , a is equal to
 (1) $bc - 2$
 (2) $2 - c - b$
 (3) $\frac{c + 2}{b}$
 (4) $\frac{2 - c}{b}$
- 25 The perimeter of a square whose area is 64 is
 (1) 16
 (2) 32
 (3) 64
 (4) 256
- 26 Given the formula $y = ax^2$. What is the numerical value of a when $x = 2$ and $y = 3$?
 (1) $\frac{2}{9}$
 (2) $\frac{3}{4}$
 (3) $\frac{3}{2}$
 (4) $\frac{4}{3}$
- 27 The graph of the equation $2x - 3y = 6$ intersects the y -axis at the point whose coordinates are
 (1) $(0, -2)$
 (2) $(0, 2)$
 (3) $(-2, 0)$
 (4) $(2, 0)$
- 28 What is the area of a circle whose radius is 10?
 (1) 10π
 (2) 20π
 (3) 25π
 (4) 100π
- 29 If Tom "hits" the basket 7 times out of 10 throws, his ratio of "hits" to "misses" is
 (1) 3:7
 (2) 3:10
 (3) 7:3
 (4) 7:10
- 30 In right triangle ABC (angle $C = 90^\circ$), $AB = 5$, $AC = 4$, and $BC = 3$. The numerical value of $\cos B$ is
 (1) $\frac{3}{5}$
 (2) $\frac{4}{5}$
 (3) $\frac{3}{4}$
 (4) $\frac{4}{3}$

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: [8, 2]
 $y = 3x + 7$
 $2x + y = 2$
- 32 The length of a rectangle is 2 inches more than its width. A diagonal of the rectangle is 10 inches long. Find the length and width of the rectangle. Check. [Only an algebraic solution will be accepted.] [5,4,1]
- 33 Write an equation or a system of equations that may be used in solving *each* of the following problems. In each case state what the variable or variables represent. [Solution of the equations is not required.]
- a A merchant has 75 pounds of walnuts that sell for 60 cents a pound. He has pecans that sell for 50 cents a pound. How many pounds of pecans should he mix with the walnuts so that he can sell the mixture for 52 cents a pound? [5]
- b A number of dimes and quarters are worth \$2.55. If the number of dimes and quarters were interchanged, the resulting new amount would be \$2.70. How many of each kind of coin were there before the interchange? [5]
- 34 A deliveryman takes a total of 9 hours driving from a warehouse to a store and back to the warehouse by the same route. On the trip to the store, the driver averages 28 m.p.h. and returning to the warehouse, he averages 35 m.p.h. How long did it take the driver to get to the store? Check. [Only an algebraic solution will be accepted.] [6, 3, 1]
- 35 a At the same time that a tree casts a shadow 38 feet long, the angle of elevation of the sun is 42° . Find to the *nearest foot* the height of the tree. [5]
- b A wire 27 feet long stretches from the top of a vertical pole to a stake in the ground 21 feet from the foot of the pole. Find to the *nearest degree* the acute angle which the wire makes with the ground. [5]
- 36 a Express the following fraction in its *lowest* terms: [5]
$$\frac{4x^2 + 12x + 9}{6x^2 + 19x + 15}$$
- b Find the root of the following equation and check: [4, 1]
$$\frac{x + 22}{6} - \frac{20 - x}{3} + 2 = 0$$
- 37 a On the same set of axes graph the solution set of the following system of inequalities: [8]
 $x < 5$
 $2x - y \geq 6$
- b Name an ordered pair in the solution set of this system. [1]
- c Name an ordered pair which is in the solution set of $2x - y \geq 6$ but not in the solution set of $x < 5$. [1]
- 38 Below are five statements. Each can be completed correctly by filling in one and *only* one of the following numbers: -1 , 0 , or 1 . On your answer paper, write the letters *a* through *e* and next to each write the correct completion chosen from the numbers given above. [10]
- a The additive identity for the set of real numbers is
- b The multiplicative identity for the set of real numbers is
- c The additive inverse of 1 is
- d The first positive integer is
- e The equation $x^2 - 1 = 0$ has two roots. The smaller of these two roots is

FOR TEACHERS ONLY

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SCORING KEY NINTH YEAR MATHEMATICS

Monday, June 19, 1967 — 1:15 to 4:15 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 18-30, allow credit if the pupil has written the correct answer instead of the number 1, 2, 3, or 4.

- | | | | |
|----------------------|-------------------------|------------------------------|--------|
| (1) $(6 + x)(6 - x)$ | (9) 2 or {2} | (17) any integer less than 2 | (25) 2 |
| (2) $3x^2 + 6x - 2$ | (10) $3y^2 - 2y + 1$ | (18) 3 | (26) 2 |
| (3) 14 | (11) $5n - 4$ | (19) 2 | (27) 1 |
| (4) 10 | (12) 3 | (20) 4 | (28) 4 |
| (5) -1 or {-1} | (13) $\frac{a - 2b}{4}$ | (21) 1 | (29) 3 |
| (6) 4 or {4} | (14) 32 | (22) 2 | (30) 1 |
| (7) 2 | (15) $12x^2 - x - 35$ | (23) 4 | |
| (8) 160 or \$160 | (16) 6.2 | (24) 4 | |

[OVER]

NINTH YEAR MATHEMATICS — *concluded*

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) Analysis [5]
 8, 6 [4]
 Check [1]

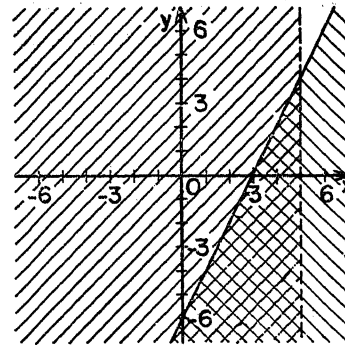
- (33) a p = no. of lbs. of pecans [5]
 $.60(75) + .50p = .52(p + 75)$
 b d = no. of dimes [5]
 q = no. of quarters
 $.10d + .25q = 2.55$
 $.25d + .10q = 2.70$

- (34) Analysis [6]
 5 hours [3]
 Check [1]

- (35) a 34
 b 39

- (36) a $\frac{2x + 3}{3x + 5}$ [5]
 b 2 [4]
 Check [1]

- (37) a [8]



- (38) Allow a total of 10 credits, 2 credits for each of the following:

- a 0
 b 1
 c -1
 d 1
 e -1