

NINTH YEAR MATHEMATICS

Wednesday, June 17, 1970—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 Evaluate the expression $b^2 - 4ac$ when $b = -3$, $a = 1$, and $c = 2$.

2 What number is the additive inverse of 9?

3 Express as a single fraction: $\frac{2}{3x} + \frac{a}{2x}$

4 Solve for x : $7x + 6 = 3x - 14$

5 Find the solution set of $.08x = 72$.

6 Solve for x : $\frac{2}{3} = \frac{8}{x}$

7 Express in terms of x the perimeter of a rectangle whose width is represented by x and whose length is represented by $2x$.

8 Find the positive square root of 61 to the nearest tenth.

9 Perform the indicated operations and express the result in simplest form:

$$\frac{x+1}{2y-2} \div \frac{x+1}{y-1}$$

10 What is the slope of the line whose equation is $3y = 2x - 5$?

11 Factor: $9x^2 - 16$

12 Represent, in terms of m , the number of seconds in m minutes and 8 seconds.

13 Express as a trinomial: $(2x + 1)(3x - 2)$

14 If $\cos x = .5446$, what is the number of degrees in the measure of angle x ?

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

16 If two supplementary angles are in the ratio of 1:3, find the number of degrees in the measure of the smaller angle.

17 Express in lowest terms: $\frac{-35x^2y^3}{45x^3y^2}$

18 Find the value of $|-8| - |2|$.

19 If t represents the tens digit of a two-digit number and u is the units digit, represent the number in terms of t and u .

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

20 The set $\{a,b,c,d\}$ is equivalent to which set?

- (1) $\{d\}$ (3) $\{5,9,13\}$
 (2) $\{a,b,c\}$ (4) $\{1,2,3,4\}$

21 If the replacement set for x is the set of positive integers, then the solution set for $\frac{x}{4} + 4 < 2$ is

- (1) $\{ \}$ (3) $\{1,2,3,\dots,8\}$
 (2) $\{1,2,3,\dots,7\}$ (4) $\{1,2,3,\dots,23\}$

22 The expression $x - 4$ has the same value as $3x - 10$ when

- (1) $3x - 10 = 0$ (3) $x = 3$
 (2) $x + 3 = 0$ (4) $x = 3\frac{1}{2}$

23 Which ordered pair is the solution of the following system of equations?

- $$\begin{aligned} 2x + 3y &= 7 \\ x + y &= 3 \end{aligned}$$
- (1) $(2,1)$ (3) $(5,-1)$
 (2) $(1,2)$ (4) $(0,3)$

24 The solution set for $x^2 + 7x + 12 = 0$ is

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

25 The expression $\sqrt{125} - \sqrt{20}$ is equivalent to

- (1) $5\sqrt{3}$ (3) $21\sqrt{5}$
 (2) $3\sqrt{5}$ (4) $\sqrt{105}$

26 A subset of the set of integers is the set of

- (1) rational numbers (3) whole numbers
 (2) irrational numbers (4) real numbers

27 If the yearly income from a \$1,000 investment is \$30, the annual interest rate is

- (1) $33\frac{1}{3}\%$ (3) 3%
 (2) 30% (4) 3%

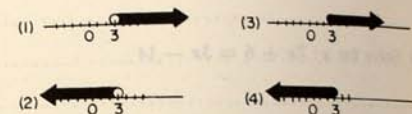
28 The coordinates of the point where the graph of $y = 2x - 1$ intersects the y -axis are

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

29 Which is an illustration of the distributive property?

- (1) $a(b + c) = ab + ac$
 (2) $ab = ba$
 (3) $a + (b + c) = (a + b) + c$
 (4) $a + b = b + a$

30 A graph of $2x \leq 6$ is



Part II

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

31 Answer either a or b, but not both:

a Using a set of coordinate axes, graph the solution set of the following system of inequalities and label the solution set A : [8,2]

$$\begin{aligned} y &\leq x - 3 \\ y &> -x + 1 \end{aligned}$$

OR

b Solve graphically and check: [8,2]

$$\begin{aligned} y &= -x \\ 2x - y &= 3 \end{aligned}$$

32 Answer both a and b:

a Find algebraically the solution set of the following system of equations and check: [4,2]

$$\frac{x - y}{2} = 1$$

$$\frac{x + y}{2} = 4$$

b Express as a single fraction in lowest terms: [4]

$$\frac{5y - 1}{2y} - \frac{5y + 2}{3y}$$

33 Find three consecutive positive integers such that the square of the smallest integer exceeds the largest integer by 10. [Only an algebraic solution will be accepted.] [5,5]

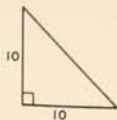
34 Write an equation or a system of equations which can be used to solve each of the following problems. In each case state what the variable or variables represent. [Solution of the equations is not required.]

a A man invested one-half of a certain sum of money at 6% and one-fifth of it at 5%. At the end of one year his income from these investments was \$200. What was the original sum of money? [5]

b At a sale of fur coats Mrs. Brown paid \$360 for a coat that had been reduced by 20% of the original price. What was the original price? [5]

35 Answer both a and b:

a The isosceles right triangle shown below has two equal sides each of which measures 10.



Find the length of the hypotenuse to the nearest integer. [5]

b In right triangle ABC , $\angle A = 38^\circ$, $\angle C = 90^\circ$, and $BC = 10$. Find AC to the nearest integer. [5]

36 Mr. Smith drove his automobile at an average speed 15 miles per hour faster than Mr. Jones. Mr. Smith drove 225 miles in the same time that Mr. Jones drove 150 miles. Find the average speed in miles per hour at which Mr. Jones drove. [Only an algebraic solution will be accepted.] [5,5]

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

a $5x + 2 < 2x + 5$ [2]

b $x^2 = 9$ [1,1]

c $2x - 1 = 0$ [2]

d $-1 < x \leq 1$ [1,1]

e $|x| = 2$ [1,1]



FOR TEACHERS ONLY

SCORING KEY

NINTH YEAR MATHEMATICS

9

Wednesday, June 17, 1970 — 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 20-30, allow credit if the pupil has written the correct answer instead of the number 1, 2, 3, or 4.

- | | | |
|-------------------------|-------------------------|--------|
| (1) 1 | (11) $(3x - 4)(3x + 4)$ | (21) 1 |
| (2) -9 | (12) $60m + 8$ | (22) 3 |
| (3) $\frac{4 + 3a}{6x}$ | (13) $6x^2 - x - 2$ | (23) 1 |
| (4) -5 | (14) 57 | (24) 4 |
| (5) {900} or 900 | (15) $\frac{c}{a + b}$ | (25) 2 |
| (6) 12 | (16) 45 | (26) 3 |
| (7) $6x$ | (17) $-\frac{7y}{9x}$ | (27) 3 |
| (8) 7.8 | (18) 6 | (28) 1 |
| (9) $\frac{1}{2}$ | (19) $10t + u$ | (29) 1 |
| (10) $\frac{1}{3}$ | (20) 4 | (30) 4 |

[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.

$$(32) \begin{array}{l} a \ x = 5 \\ \quad y = 3 \\ \text{Check} \end{array} \quad [4]$$

$$b \ \frac{5y - 7}{6y} \quad [4]$$

$$(33) \text{ Analysis } [5]$$

$$4, 5, 6 \quad [5]$$

$$(34) \begin{array}{l} a \ x = \text{original sum of money} \\ \quad .06(\frac{1}{2}x) + .05(\frac{1}{3}x) = 200 \end{array} \quad [5]$$

$$b \ x = \text{original price} \\ x - .20x = 360 \quad [5]$$

$$(35) \begin{array}{l} a \ 14 \quad [5] \\ b \ 13 \quad [5] \end{array}$$

$$(36) \text{ Analysis } [5]$$

$$30 \quad [5]$$

(Part credit as indicated)

$$(37) \begin{array}{l} a \ (-3, -2, -1, 0) \text{ or} \\ \quad -3, -2, -1, 0 \quad [2] \\ b \ (3, -3) \text{ or } 3, -3 \quad [1, 1] \\ c \ (\quad) \text{ or } \phi \quad [2] \\ d \ (0, 1) \text{ or } 0, 1 \quad [1, 1] \\ e \ (2, -2) \text{ or } 2, -2 \quad [1, 1] \end{array}$$

DO YOU KNOW ...

... that most questions used on Regents examinations have been tried out in advance in representative classrooms throughout the State?

Each year more than 40,000 pupils in about 300 schools "pretest" questions intended for use in future Regents examinations. When committees of classroom teachers meet to assemble Regents examinations, the information obtained from this pretesting is to aid them in determining which questions are appropriate, which questions need revision, and which questions should be eliminated.