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. Solve for \( a \): \( \frac{3}{5} = \frac{9}{a} \)

2. Solve for \( a \): \( 3a - a + 4a = 90 \)

3. If \( \cos A = 0.7193 \), what is the measure, in degrees, of angle \( A \)?

4. Solve for \( x \): \( 5x + 2 = 3(x + 6) \)

5. Multiply and express as a trinomial:
   \( (x + 7)(x - 9) \)

6. Solve the following system of equations for \( x \):
   \[
   \begin{align*}
   3x - 5y &= 6 \\
   4x + 5y &= 8
   \end{align*}
   \]

7. What is the quotient when \( x^2 + 5x + 6 \) is divided by \( x + 3 \)?

8. Solve for \( y \): \( 0.03y = 6 \)

9. Find \( \sqrt{27} \) to the nearest tenth.

10. Express the sum of \( \frac{x}{5} \) and \( \frac{3x}{4} \) as a single fraction.

11. Reduce \( \frac{16x^3}{8x^2} \) to lowest terms.

12. The lengths of the sides of a triangle are 3, 5, and 7. If the length of the shortest side of a similar triangle is 9, what is the length of the longest side of the second triangle?

13. From \( 6m + b \), subtract \( 4m - b \).

14. Express the average of \( 4x - 2 \) and \( 2x + 6 \) in terms of \( x \).

15. Solve for \( x \): \( \frac{3}{2}x + 2 = 14 \)

16. What percent of 120 is 30?

17. Solve for \( b \) in terms of \( a, c, \) and \( d \):
   \[ a = bc - d \]

18. The length of the hypotenuse of a right triangle is 15 and the length of one leg is 9. Find the length of the other leg.

19. Find the positive root of \( x^2 - 16 = 0 \).

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 \( x = 3 \), the expression \( 5x - 3x^2 \) is equal to
   (1) −12 \hspace{1cm} (2) 6 \hspace{1cm} (3) 12 \hspace{1cm} (4) 42

21. If \( A = \{1,3,5,7\} \), which set is not a subset of \( A \)?
   (1) \( \{1\} \) \hspace{1cm} (2) \{1,3,5,7\} \hspace{1cm} (3) \{\} \hspace{1cm} (4) \{0\}

22. The value of \( |−3 - 8| \) is
   (1) 5 \hspace{1cm} (2) −5 \hspace{1cm} (3) 11 \hspace{1cm} (4) −11

23. The inequality \( 2y + 3 > 5 \) is equivalent to
   (1) \( y < 1 \) \hspace{1cm} (2) \( y > 1 \) \hspace{1cm} (3) \( y < 4 \) \hspace{1cm} (4) \( y > 4 \)
24 The product of $2a^2$ and $3c$ is

(1) $\frac{2a^2}{3c}$  
(2) $2a^2 - 3c$  
(3) $6a^2c$  
(4) $2a^2 + 3c$

25 An equation of the line parallel to the x-axis and 2 units below it is

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

26 Which value of $x$ will make the expression $\frac{7}{x - 1}$ meaningless?

(1) 1  
(2) -1  
(3) 0  
(4) 8

27 If $x$ represents an even integer, which expression represents the next larger consecutive even integer?

(1) $x - 1$  
(2) $x + 2$  
(3) $x + 1$  
(4) $x + 3$

28 What is the sum of 7 and its additive inverse?

(1) 1  
(2) 14  
(3) 49  
(4) 0

29 Which property is illustrated by the equation $8 + (4 + 3) = (8 + 4) + 3$?

(1) associative property under addition  
(2) commutative property under addition  
(3) commutative property under multiplication  
(4) reflexive property

30 Which inequality is represented by the graph below?

(1) $\{x|x > -1\}$  
(2) $\{x|x < -1\}$  
(3) $\{x|x \leq -1\}$  
(4) $\{x|x \geq -1\}$

**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. [40]

31 On the same set of coordinate axes, graph the following system of inequalities and label the solution set S.

\[
\begin{align*}
3x + y & > 9 \\
y & \leq 3
\end{align*}
\] [8.2]

32 Solve algebraically and check:

\[
\begin{align*}
2x + 7y &= 8 \\
3x + 2y &= -5
\end{align*}
\] [8.2]

33 Answer both a and b:

a Express the indicated product as a single fraction in lowest terms:

\[
\frac{x^2 - 3x - 10}{x^2 + 2x} \cdot \frac{2x + 10}{x^2 - 25}
\] [6]

b Solve for x:

\[
\frac{x + 3}{2} + \frac{x - 2}{3} = 5
\] [4]

34 From January through October, ACE Autos sold 150 cars. The number of cars sold in November and the number of cars sold in December were in the ratio 3:5. If the total number of cars sold in the year was 390, find the number of cars sold in December. [Only an algebraic solution will be accepted.] [6.4]

35 Find 3 consecutive positive integers such that the product of the first and third integers is 48. [Only an algebraic solution will be accepted.] [5.5]

36 As shown in the accompanying diagram, a vertical flagpole is 70 feet high. A guy wire 90 feet long extends from the top of the pole to a stake in the ground.

\[
\begin{align*}
\text{90'} \\
\text{70'}
\end{align*}
\]

a Find, to the nearest degree, the measure of the angle that the wire makes with the ground. [5]

b Find, to the nearest foot, the distance from the base of the flagpole to the stake. [5]

37 On your answer paper, write the letters a through e. After each letter, write the answer to the corresponding question below. [10]

a What number is the additive identity element?

b What number is the multiplicative inverse of \(-\frac{4}{3}\)?

c What number has no multiplicative inverse?

d What is the additive inverse of 2?

e Write a number which is equal to its multiplicative inverse.
### Tables of Natural Trigonometric Functions

(For use with 9th and 10th Year Mathematics Regents Examinations)

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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

NINTH YEAR MATHEMATICS

Thursday, August 13, 1987—8:30 to 11:30 a.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.

The declaration below should be signed when you have completed the examination.

I do hereby affirm, at the close of this examination, that I had no unlawful knowledge of the questions or answers prior to the examination, and that I have neither given nor received assistance in answering any of the questions during the examination.

______________________________
Signature

Math. 9–Aug. ’87 [7]
FOR TEACHERS ONLY

SCORING KEY
NINTH YEAR MATHEMATICS

Thursday, August 13, 1957—8:30 to 11:30 a.m., only

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.

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 numeral 1, 2, 3, or 4.

(1) 15
(2) 15
(3) 44
(4) 8
(5) $x^2 - 2x - 63$
(6) 2
(7) $x + 2$
(8) 200
(9) 5.2
(10) $\frac{19x}{20}$

(11) $2x$
(12) 21
(13) $2m + 2b$
(14) $3x + 2$
(15) 8
(16) 25
(17) $\frac{a + d}{c}$
(18) 12
(19) 4
(20) 1

(21) 4
(22) 3
(23) 2
(24) 3
(25) 4
(26) 1
(27) 2
(28) 4
(29) 1
(30) 3
Ninth Year Mathematics — concluded

Part II

Please refer to the Department publication Guide for Rating Regents Examinations 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) \((-3,2)\) or \(\frac{x}{y} = \frac{-3}{2}\) [5]

Check [2]

(33) \(a \frac{2}{x}\) [6]

\(b 5\) [4]

(34) Analysis [6]

150 [4]

(35) Analysis [5]

6, 7, 8 [5]

(36) \(a 51\) [5]

\(b 57\) [5]

(37) \(a 0\) [2]

\(b \frac{3}{4}\) [2]

\(c 0\) [2]

\(d -2\) [2]

\(e 1\) or \(-1\) [2]

As a reminder...

Regents examinations based on the Ninth Year Mathematics syllabus will not be offered after January 1988.