

**Alberta Provincial
Achievement Testing**

**Subject
Bulletin
2017–2018**

**GRADE
9**

Mathematics



Alberta  Government

This document was written primarily for

| | |
|------------------|-----------------------|
| Students | |
| Teachers | ✓ Grade 9 Mathematics |
| Administrators | ✓ |
| Parents | |
| General Audience | |
| Others | |

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You can find [achievement test-related materials](#) on the Alberta Education website.

Additional topics of interest are found in the [General Information Bulletin](#).

Grade 9 Mathematics Assessment

Special-format Practice Tests

To provide students an opportunity to practise provincial achievement test-style questions and content in Braille, audio, large print, or coloured print versions, Alberta Education is making special-format practice tests available. Tests are offered in all subjects with a corresponding provincial achievement test. Alberta schools with registered Alberta K–12 students may place orders for these tests. Braille tests are available in English, and by request in French. All tests are provided free of charge, but limits may be placed on order volumes to ensure access for everyone.

For more information or to place an order, contact

Laura LaFramboise
Distribution Coordinator, Examination Administration
780-982-1644 or Laura.LaFramboise@gov.ab.ca

NEW *General Description

The Grade 9 Mathematics Achievement Test consists of two parts:

- Part A contains 20 numerical-response questions and was designed to be completed in 20 minutes. Part A will assess students' foundational skills and fluency in mental math, estimation, computation, and algebra, without the use of calculators.
- Part B contains 32 multiple-choice questions and 8 numerical-response questions. Part B was designed to be completed in 70 minutes. Students may use manipulatives and calculators to complete Part B.

The test was designed to be completed in 90 minutes; however, students may have up to 180 minutes to complete this test, plus an additional 30 minutes if needed. Teachers have the flexibility to allocate the extra 120 minutes between Part A and Part B as they see fit.

The following bullets briefly describe the two item formats:

- Multiple-choice items that provide students with four response options, of which only one is correct.
- Numerical-response items that require students to generate a response (in symbolic form) to a particular problem, rather than selecting a response from a list of four options.

Test items are also categorized in terms of three levels of item complexity: low, moderate, and high. Low-complexity items require responses involving the simple recall and recognition of previously learned concepts and principles. Moderate-complexity items require responses that go beyond the habitual and may require more-informal methods of reasoning and problem solving. High-complexity items require responses that are based on more-abstract reasoning, planning, analysis, judgment, and creative thought. (See *Appendix 1* for a more detailed explanation of each complexity level.)

***NEW** *Use of Calculators and Manipulatives*

Part A: Manipulatives may be used, but use of a calculator is not permitted.

Part B: Students may use calculators and manipulatives; however, use of graphing calculators is not permitted.

An acceptable manipulative is any mathematical tool that can be used by a student to help convert abstract ideas into concrete representations for the purpose of solving a problem (e.g., pattern blocks, tiles and cubes, geoboards, tangrams, counters, spinners, number lines). The manipulative cannot perform the mental conversion or provide the solution to a problem (e.g., multiplication table).

***NEW** *Local Marking of Test Part A and Part B*

Marking keys will be provided to teachers for marking purposes. Teachers are expected to record and report the raw scores achieved on the test by their students to parents. Raw scores achieved by students on Part A and Part B are to be reported separately to parents and are not to be combined into a total test score.

*NEW Grade 9 Mathematics Achievement Test Blueprint

| Test Component | Number of Questions | Question Format | Weighting on Total Test Score |
|----------------|---------------------|---------------------------------------|-------------------------------|
| Part A | 20 | Numerical Response | *TBA |
| Part B | 32 8 | Multiple Choice Numerical Response | *TBA |

*TBA - To be announced.

| Content Domain of Test (Strand) | Part A: Percentage of Questions | Part B: Percentage of Questions |
|---------------------------------|------------------------------------|------------------------------------|
| Number | *TBA | 25 – 35% |
| Patterns and Relations | *TBA | 35 – 45% |
| Shape and Space | | 20 – 30% |
| Statistics and Probability | | 5 – 10% |

*TBA - To be announced.

| Cognitive Domain of Test (Complexity Level) | Part A: Percentage of Questions | Part B: Percentage of Questions |
|---|------------------------------------|------------------------------------|
| Low | 100% | 30 – 40% |
| Moderate | | 45 – 55% |
| High | | 10 – 20% |

Description of Mathematics Assessment Standards

The following statements describe what is expected of Grade 9 students at the acceptable standard and the standard of excellence based on outcomes in the [program of studies](#). These statements represent examples of the standards against which student achievement is measured. It is important to remember that one test cannot measure all the outcomes in the program of studies.

| Acceptable Standard | Standard of Excellence |
|--|---|
| <p>Students who meet the acceptable standard in Grade 9 Mathematics are typically able to:</p> <ul style="list-style-type: none">recall and apply a moderate number of mathematical properties to solve routine problemsutilize familiar problem-solving strategies to solve routine problemsconnect and apply personal experiences and problem-solving strategies to solve routine problemsrecall and apply mathematical concepts and operational terms to solve routine problemsapply computation skills and formal mathematics vocabularies to solve routine problemsrecognize and describe numerical and non-numerical patternsutilize semantic knowledge to construct correct mental representations of word problemsuse logical processes to analyze and solve routine problemsrecognize and use mathematical patterns to make predictions when solving routine problemstest generalizations from patterns to reach conclusions | <p>Students who meet the standard of excellence in Grade 9 Mathematics are typically able to:</p> <ul style="list-style-type: none">recall and apply a variety of mathematical properties to solve novel problemsutilize a variety of problem-solving strategies to solve novel problemsconnect and apply personal experiences and strategies to check and verify solutions to novel problemsapply abstract thinking skills to reframe mathematical concepts to solve novel problemsgenerate linguistic and nonlinguistic representations of knowledge to solve novel problemsdemonstrate fluency in working with patterns represented concretely, pictorially, or symbolicallyutilize semantic knowledge to construct and reframe correct mental representations of word problemsuse logical processes to analyze complex problems, reach conclusions, and justify or defend conclusionsrecognize, extend, create, and use mathematical patterns to make and justify predictions when solving novel problemsmake generalizations from patterns to reach conclusions |

Preparing Students for the Mathematics Test

Suggestions for Preparing Students

The best way to prepare students for writing the achievement test is to teach the curriculum well and to ensure that students know what is expected. Many of the skills and attitudes that support test writing are, in fact, good skills and strategies for approaching all kinds of learning tasks.

Note that most of the questions on the mathematics test are placed in real-life contexts.

Teachers are encouraged to familiarize their students with the types of questions that will appear on the test. [Released items](#) from previously secured tests are available on the Alberta Education website.

Teachers are also encouraged to share the following information with their students to help them prepare for the Grade 9 Mathematics Achievement Test.

Suggestions for Answering Questions

- Before you begin, find out how much time you have.
- Ask questions if you are unsure of anything.
- Skim through the whole test before beginning. Find out how many questions there are and plan your time accordingly.
- Answer the easier questions first; then go back to the more difficult ones.
- Do not spend too much time on any one question. Make a mark (*) or (?) beside any questions you have difficulty with and go back to them if you have time.
- Read each question carefully, underline or highlight key words, and try to determine an answer before looking at the choices.

- Read all the choices and see which one best fits the answer.
- When you are not sure which answer is correct, cross out any choices that are wrong, and then select the best of the remaining choices.
- If time permits, recheck your answers.
- Double-check to make sure that you have answered everything before handing in the test.
- Read the information given using the strategy that works best for you. You should either
 - look at all the information and think carefully about it before you try to answer the question

OR

- read the questions first and then look at the information, keeping in mind the question(s) you need to answer.
- Make sure that you look at all forms of the information given. Information may be given in words, charts, pictures, graphs, or maps.
- When information is given for more than one question, go back to the information before answering each question.
- Check your work when you calculate an answer, even when your answer is one of the choices.
- When answering “best answer” questions, be sure to carefully read all four alternatives (A, B, C, and D) before choosing the answer that you think is best. These questions will always include a bold-faced qualifier such as **best**, **most strongly**, or **most clearly** in their stems. All the alternatives (A, B, C, and D) are, to some degree, correct, but one of the alternatives will be “best” in that it takes more of the information into account or can be supported most strongly by reference to the information.

Opportunities to Participate in Test Development Activities

Field Testing

All Achievement Testing Program test questions are field tested before use. By “testing” the test questions, students who write field tests have an opportunity for a practice run at writing questions that could be used on future achievement tests. As well, the teachers have an opportunity to comment on the appropriateness and quality of the test questions.

Through the online field test request system, teachers can create and modify field test requests and check the status of these requests. Information regarding the field test process and the request system is available at [Provincial Achievement Tests](#).

Once the completed requests are received by the Provincial Assessment Sector, classes will be selected to ensure that a representative and sufficiently large sample of students from across the province take part in the field test. Every effort will be made to place field tests as requested; however, because field tests are administered to a prescribed number of students, it may not be possible to fill all requests.

For further information about achievement field testing, see the Field Testing section of the [General Information Bulletin](#).

Working Groups

Teacher involvement in the development of provincial achievement tests is important because it helps to ensure the validity and appropriateness of the assessments.

To be selected to participate in a working group, a teacher must be nominated by a school administrator or superintendent, and that nomination must be approved by the superintendent. To ensure that selected working-group members have appropriate subject matter training and teaching experience, nominees are asked to provide their information to their school administrator so that it can be forwarded to the Provincial Assessment Sector at Alberta Education through the superintendent.

Test Development

Teacher working groups are used throughout the test development process to create raw forms of test questions, and to review and revise draft forms of provincial achievement tests. These working groups usually meet for one or two days, two or three times per year. Occasionally, these meetings are held on weekends or in the summer.

To be eligible to serve on a test development working group, a teacher must currently be teaching Grade 9 Mathematics and must have a minimum of two years' experience teaching the course.

Teachers participating in test development and/or test review working groups are selected from the working-group nominees provided by superintendents of school jurisdictions.

***NEW** *Appendix 1*

Part A: Sample Questions

1. What is $(-2) \times (-1) \times (-3)$?

Answer: _____

2. What is 30% of 42?

Answer: _____

3. What is the value
of $\frac{(-4)^2 \times (-4)^3 \times (-4)^4}{(-4)^6}$?

Answer: _____

4. What is the value of $[-(-3^0)^2 - (2^2)^1]^2$?

Answer: _____

5. What is $4^3 - 3^4$?

Answer: _____

6. Evaluate 17^2 .

Answer: _____

7. Solve for x in the following equation.

$$2.6 + x = 4x + 1.4$$

Answer: $x =$ _____

8. Solve for x in the following equation.

$$0.4(20 - 10x) = 14x - 28$$

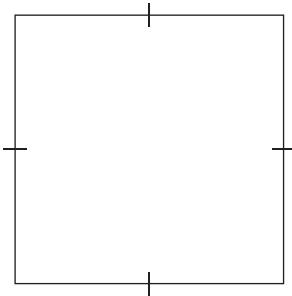
Answer: $x =$ _____

9. What is the value of $\sqrt{\frac{145}{4}}$ to the nearest whole number?

Answer: _____

(Record the answer on the answer sheet.)

Use the following information to answer question 10.



10. If the area of the square shown above is 135 cm^2 , what is the side length to the nearest tenth of a centimetre?

Answer: _____

(Record the answer on the answer sheet.)

- 11.** Order the following rational numbers from **smallest** value to **greatest** value, using the numbers **1**, **2**, **3**, and **4**.

Use the number **1** to represent the **smallest** value and the number **4** to represent the **greatest** value.

Answer: _____, _____, _____
 $\sqrt{\frac{4}{9}}$ $-1.\overline{5}$ -1.75 $-\frac{8}{5}$

(Record all **four digits** of your answer on the answer sheet.)

- 12.** What is the value of $0.4 \div 0.8 - \sqrt{\frac{9}{36}} \times 1\frac{1}{5}$?

Answer: $x =$ _____

(Record your answer on the answer sheet.)

- 13.** What is the largest value of $(a^b \div a^d)^c$ when the variables in the expression represent the digits 1, 2, 3, and 4? (Each variable can only represent one of the four digits.)

Answer: _____

(Record the answer on the answer sheet.)

Appendix 2

Levels of Item Complexity

Low Complexity

Items in this category require students to rely heavily on recalling and recognizing previously learned concepts and principles. Items typically specify what students are to do, which is often to carry out some procedure that can be performed mechanically. Students would not be expected to come up with original methods for finding a particular solution. The following list illustrates some of the demands that items of low complexity may require of students:

- Recall or recognize a fact, term, or property
- Recognize an example of a concept
- Perform a specified procedure
- Evaluate an expression in an equation or formula for a single variable
- Solve a one-step word problem
- Draw or measure simple 2-D shapes or 3-D objects
- Retrieve information from a graph, table, or figure

Moderate Complexity

Items in this category involve more flexibility of thinking and choice among alternatives than do those in the low-complexity category. They require a response that goes beyond the habitual, is not specified, and may require more than a single step. The student is expected to decide what to do, using informal methods of reasoning and problem-solving strategies, and to bring together skill and knowledge from various domains. The following list illustrates some of the demands that items of moderate complexity may require of students:

- Solve a word problem requiring multiple steps
- Compare figures or statements
- Provide a justification for steps in a solution process
- Interpret a visual representation
- Retrieve information from a graph, table, or figure and use it to solve a problem requiring multiple steps
- Interpret a simple argument
- Generalize a pattern

High Complexity

Items in this category make heavy demands on students by requiring them to engage in more-abstract reasoning, planning, analysis, judgment, and creative thought. The following list illustrates some of the demands that items of high complexity may require of students:

- Perform a procedure having multiple steps and multiple decision points
- Analyze similarities and differences between procedures and concepts
- Formulate an original problem, given a situation
- Solve a problem in more than one way
- Explain and justify a solution to a problem
- Describe, compare, and contrast solution methods
- Formulate a mathematical model for a complex situation
- Analyze the assumptions made in a mathematical model
- Analyze or produce a deductive argument
- Provide a mathematical justification

Adapted from Norman L. Webb, Wisconsin Center for Educational Research, “Depth-of-Knowledge Levels for Four Content Areas,” March 28, 2002.

Appendix 3

Grade 9 Mathematics Formula Sheet

The following information may be useful in writing this test.

Area (A)

Circle $A = \pi r^2$

Rectangle $A = lw$

Triangle $A = \frac{bh}{2}$

Volume (V)

Right Cylinder $V = \pi r^2 h$

Prism $V = (\text{Base Area})(h)$

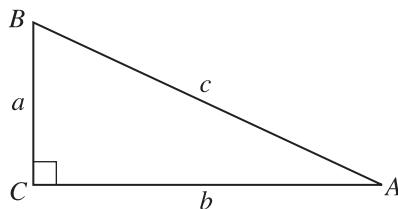
Fold and tear along perforation.

Circumference (C)

Circle $C = \pi d$ or $2\pi r$

Pythagorean Theorem

$$c^2 = a^2 + b^2 \text{ where } c \text{ is the hypotenuse}$$



*NEW

Appendix 4

Part A Answer Sheet



Name

Apply Label With Student's Name

To be completed by/for ALL students.

LAST NAME (please print) _____

FIRST NAME _____

To be completed ONLY for students without labels.

ALBERTA STUDENT NUMBER _____

SCHOOL NAME _____

SCHOOL CODE _____

BIRTH DATE (Year/Month/Day)

ACCOMMODATIONS USED
(mark all applicable)

HOME EDUCATED FOR
THIS SUBJECT

COMPLETED THE COURSE
IN A YEAR OTHER THAN
THE YEAR OF TESTING

- 1 6
2 7
3 8
4 9
5 10

SEE ACCOMMODATIONS IN THE
GENERAL INFORMATION BULLETIN
FOR MORE INFORMATION.



| | | | | | | |
|--|---|---|---|--|---|---|
| EXAMPLE | RIGHT | EXAMPLE | RIGHT | | | |
| What is 1.5 – 2.0? Answer: -0.5 | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 10px; height: 10px; background-color: blue;"></td> <td style="width: 10px; height: 10px; background-color: black;"></td> <td style="width: 10px; height: 10px; background-color: blue;"></td> </tr> </table> | | | | Alberta is a 1 <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> WRONG | 1 <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> WRONG |
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| | | 10 <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> WRONG | | | | |

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GRADE 9

ACHIEVEMENT TEST MATHEMATICS

Part A



Fold and tear along perforation.

GRADE 9 MATHEMATICS ACHIEVEMENT TEST

PART A

NUMERICAL RESPONSE

| | | | | | | | | | | | | | | | | | | | |
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Part B Answer Sheet

Name

Apply Label With Student's Name

To be completed by/for ALL students.

LAST NAME (please print) _____

FIRST NAME _____

To be completed ONLY for students without labels.

ALBERTA STUDENT NUMBER _____

SCHOOL NAME _____

SCHOOL CODE _____

BIRTH DATE (Year/Month/Day)

ACCOMMODATIONS USED
(mark all applicable)

HOME EDUCATED FOR
THIS SUBJECT

COMPLETED THE COURSE
IN A YEAR OTHER THAN
THE YEAR OF TESTING

- 1 6
2 7
3 8
4 9
5 10

SEE ACCOMMODATIONS IN THE
GENERAL INFORMATION BULLETIN
FOR MORE INFORMATION.



GRADE 9 ACHIEVEMENT TEST MATHEMATICS Part B

IMPORTANT INSTRUCTIONS FOR MARKING ANSWERS

1. USE HB PENCIL ONLY.
2. MAKE HEAVY BLACK MARKS TO FILL CIRCLE COMPLETELY.
3. TO CHANGE AN ANSWER, ERASE THE OLD MARK CLEANLY BEFORE FILLING IN THE NEW CIRCLE.
4. DO NOT MAKE ANY STRAY MARKS ON THIS PAPER.

| EXAMPLE | RIGHT | EXAMPLE | RIGHT | | | | | | | | | | | | |
|---|---|-----------------------|-----------------------|---|--|----------------------------------|----------------------------------|-----------------------|-----------------------|---|---|---|---|--|--------------|
| What is $5.4 - 5.1?$ Answer: 0.3 | <table border="1"><tr><td>0</td><td>.</td><td>3</td><td></td></tr><tr><td><input checked="" type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> | 0 | . | 3 | | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 0 | 0 | 0 | 0 | Alberta is a 1 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D 2 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D 3 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D 4 <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D | WRONG |
| 0 | . | 3 | | | | | | | | | | | | | |
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| 0 | . | 3 | | | | | | | | | | | | | |
| <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | | | | | | | | | | |
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| 0 | . | 3 | | | | | | | | | | | | | |
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| 0 | 0 | 0 | 0 | | | | | | | | | | | | |

Alberta
Education
PAT911001M.03

GRADE 9 MATHEMATICS ACHIEVEMENT TEST

PART B

MULTIPLE CHOICE

| | | |
|----------------|----------------|----------------|
| 1 A (B) C (D) | 12 A (B) C (D) | 23 A (B) C (D) |
| 2 A (B) C (D) | 13 A (B) C (D) | 24 A (B) C (D) |
| 3 A (B) C (D) | 14 A (B) C (D) | 25 A (B) C (D) |
| 4 A (B) C (D) | 15 A (B) C (D) | 26 A (B) C (D) |
| 5 A (B) C (D) | 16 A (B) C (D) | 27 A (B) C (D) |
| 6 A (B) C (D) | 17 A (B) C (D) | 28 A (B) C (D) |
| 7 A (B) C (D) | 18 A (B) C (D) | 29 A (B) C (D) |
| 8 A (B) C (D) | 19 A (B) C (D) | 30 A (B) C (D) |
| 9 A (B) C (D) | 20 A (B) C (D) | 31 A (B) C (D) |
| 10 A (B) C (D) | 21 A (B) C (D) | 32 A (B) C (D) |
| 11 A (B) C (D) | 22 A (B) C (D) | |

NUMERICAL RESPONSE

| | | | | |
|---|---|---|---|---|
| 1 | 5 | 6 | 7 | 8 |
| 2 | 4 | 3 | 2 | 1 |
| 3 | | | | |
| 4 | | | | |

0 1 2 3 4 5 6 7 8 9 .

*NEW Appendix 5

Part A Instructions Pages

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Grade 9 Achievement Test

Mathematics Part A

Numerical Response

Description

The Grade 9 Mathematics Achievement Test consists of two parts:

- Part A contains 20 numerical-response questions and was designed to be completed in 20 minutes.
- Part B contains 32 multiple-choice questions and 8 numerical-response questions. Part B was designed to be completed in 70 minutes.

Time: 90 minutes. You have up to 180 minutes to complete this test plus an additional 30 minutes should you need it. The extra time can be shared between Part A and Part B, as decided by your teacher.

A formula sheet is included in this booklet.

Instructions

- Use **only** an HB pencil to mark your answer.
- You may use manipulatives; however, use of a calculator is **not** permitted.
- Try to answer every question.
- If you change an answer, **erase** your first mark or marks **completely**.

You may write in this booklet if you find it helpful. Make sure that your answers to the numerical-response questions are placed on the answer sheet.

2018

Numerical Response

- Record your answer on the answer sheet provided by writing it in the boxes.
- Enter your answer, with one digit per box, beginning in the left-hand box. A decimal point, if needed, goes in its own box. A negative sign (–), if needed, goes in its own box. Do not include a plus sign (+) if the answer is positive. Leave any unused boxes blank.
- You may fill in the bubbles below each of your answers **after** you have completed this test.

Example 1

What is $1 - 5$?

Answer: -4

Record -4 on the answer sheet →

| | | | |
|----------------------|--------------------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text" value="4"/> | <input type="text"/> | <input type="text"/> |
|----------------------|--------------------------------|----------------------|----------------------|

Fill in the corresponding circles

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Example 2

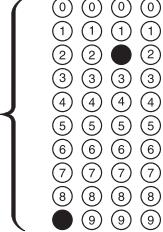
If $x = 4.6$, then what does $2x$ equal?

Answer: 9.2

Record 9.2 on the answer sheet →

| | | | |
|---|---|---|--|
| 9 | . | 2 | |
|---|---|---|--|

Fill in the corresponding circles



Example 3

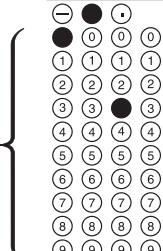
What is $5.4 - 5.1$?

Answer: 0.3

Record 0.3 on the answer sheet →

| | | | |
|---|---|---|--|
| 0 | . | 3 | |
|---|---|---|--|

Fill in the corresponding circles



Example 4

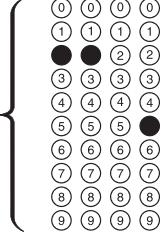
What is 7.5×3 ?

Answer: 22.5

Record 22.5 on the answer sheet →

| | | | |
|---|---|---|---|
| 2 | 2 | . | 5 |
|---|---|---|---|

Fill in the corresponding circles



Example 5

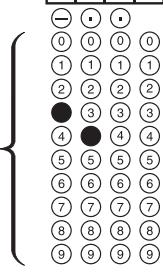
What is the value of $\frac{1}{4} + \frac{1}{2}$ expressed as a fraction?

Answer: $\frac{3}{4}$ (Record in the first box)
 $\frac{4}{4}$ (Record in the second box)

Record 34 on the answer sheet →

| | | | |
|---|---|--|--|
| 3 | 4 | | |
|---|---|--|--|

Fill in the corresponding circles



Example 6

$$78.5 - 24.2 = 5__.3$$

In the equation above, which digit could be placed in the blank space to make the equation correct?

(Record only the missing digit on the answer sheet.)

Answer: 54.3

Record 4 on the answer sheet →

| | | | |
|---|--|--|--|
| 4 | | | |
|---|--|--|--|

Fill in the corresponding circles

| | | |
|---|---|---|
| – | • | • |
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| ● | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |

Example 7

$$786.5 - 244.2 = 5___.3$$

In the equation above, which two digits could be placed in the blank spaces to make the equation correct?

Answer: 542.3

(Record only the two missing digits, in order, on the answer sheet.)

Answer: 542.3

Record 42 on the answer sheet →

| | | | |
|---|---|--|--|
| 4 | 2 | | |
|---|---|--|--|

Fill in the corresponding circles

| | | |
|---|---|---|
| – | • | • |
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | ● | 2 |
| 3 | 3 | 3 |
| ● | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |

Part B Instructions Pages

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Grade 9 Achievement Test

Mathematics Part B

Multiple Choice and Numerical Response

Description

The Grade 9 Mathematics Achievement Test consists of two parts:

- Part A contains 20 numerical-response questions and was designed to be completed in 20 minutes.
- Part B contains 32 multiple-choice questions and 8 numerical-response questions. Part B was designed to be completed in 70 minutes.

Time: 90 minutes. You have up to 180 minutes to complete this test plus an additional 30 minutes should you need it. The extra time can be shared between Part A and Part B, as decided by your teacher.

A formula sheet is included in this booklet.

Instructions

- Use **only** an **HB** pencil to mark your answer.
- You may use a ruler, manipulatives, and a calculator; however, a graphing calculator is **not** permitted. Use of a protractor is also **not** permitted.
- Read each question carefully and choose the **correct** or **best** answer.
- Try to answer every question.
- If you change an answer, **erase** your first mark **completely**.
- Now read the detailed instructions for answering multiple-choice and numerical-response questions.

You may write in this booklet if you find it helpful. Make sure that your answers to the multiple-choice and numerical-response questions are placed on the answer sheet.

2018

Multiple Choice

- Each question has four possible answers from which you are to choose the **correct** or **best** answer.
- Locate the question number on the separate answer sheet provided and fill in the circle that corresponds to your choice.

Example

If $x = 3$, what is the value of $x + 8$?

- A. 10
- B. 11
- C. 12
- D. 13

Answer: 11

Answer Sheet
Ⓐ Ⓑ Ⓒ Ⓓ

Numerical Response

- Record your answer on the answer sheet provided by writing it in the boxes and then by filling in the corresponding circles.
- **Enter your answer, one digit per box, beginning in the left-hand box. A decimal point, if needed, goes in its own box. Leave any unused boxes blank.**

Calculation Question and Solution

Example 1

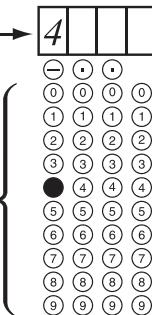
What is $5 - 1$?

Answer: 4

Record 4 on the answer sheet →

| | | | |
|---|--|--|--|
| 4 | | | |
|---|--|--|--|

Fill in the corresponding circles



Example 2

If $x = 4.6$, then what does $2x$ equal?

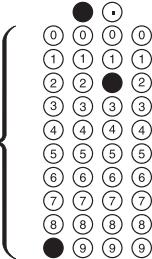
(Record your answer in the numerical-response section on the answer sheet.)

Answer: 9.2

Record 9.2 on the answer sheet →

| | | | |
|---|---|---|--|
| 9 | . | 2 | |
|---|---|---|--|

Fill in the corresponding circles



Example 3

What is $5.4 - 5.1$?

Answer: 0.3

Record 0.3 on the answer sheet

| | | | |
|---|---|---|--|
| 0 | . | 3 | |
|---|---|---|--|

Fill in the corresponding circles

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Example 4

What is 7.5×3 ?

Answer: 22.5

Record 22.5 on the answer sheet

| | | | | |
|---|---|---|---|--|
| 2 | 2 | . | 5 | |
|---|---|---|---|--|

Fill in the corresponding circles

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Matching Question and Solution

Example

The following pictures are of 2-D shapes.



1



2



3



4

Match each shape, as numbered above, with its name, as given below.

_____ Triangle _____ Pentagon _____ Circle _____ Quadrilateral

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

Answer: 2431

Record 2431 on the answer sheet

| | | | |
|---|---|---|---|
| 2 | 4 | 3 | 1 |
|---|---|---|---|

Fill in the corresponding circles

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

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