
Grade 9 Subject Bulletin Mathematics

Alberta Provincial Achievement Testing **2025-2026**

This document was written primarily for

Students

Teachers ✓ Grade 9 Mathematics

Administrators ✓

Parents

General Audience

2025–2026 Mathematics 9 Subject Bulletin

Distribution: This document is posted on the [Alberta Education and Childcare website](#).

© Copyright 2025, the Crown in Right of Alberta, as represented by the Minister of Education and Childcare, Alberta Education and Childcare, Provincial Assessment, 6th floor 44 Capital Boulevard, 10044 108 Street NW, Edmonton, Alberta T5J 5E6, and its licensors. All rights reserved.

Special permission is granted to **Alberta educators only** to reproduce this document for educational purposes and on a non-profit basis.

Excerpted material in this document **shall not** be reproduced without the written permission of the original publisher (see credits, where applicable).

Contents

Grade 9 Mathematics Provincial Achievement Test.....	1
• General description	1
• Test administration	1
Description of Grade 9 Mathematics provincial assessment standards.....	2
• Use of calculators and manipulatives	3
• Scoring and reporting	3
• Blueprints	4
Preparing Students for the Grade 9 Mathematics Provincial Achievement Test	5
• Suggestions for preparing students	5
• Special-format practice tests	5
• Suggestions for answering questions	6
Opportunities to Participate in Test-development Activities	7
• Field testing	7
• Working groups	7
Appendix 1: Levels of Item Complexity.....	8
Appendix 2: Grade 9 Mathematics Formula Sheet.....	9
Appendix 3: Example of Grade 9 Mathematics Part A Instructions Page.....	10
Appendix 4: Example of Grade 9 Mathematics Part B Instructions Page.....	11
Appendix 5: Examples of Descriptions for Text to Speech on the Mathematics 9 Provincial Achievement Test.....	12
• Units	12
• Numerical values	13
• Symbols and notation	13
• Tables	14
• Graphs	15
• Line graphs	16
• Bar graphs	17
• Number lines	18
• Numerical-response blanks	18
Provincial Assessment Contacts	19

Grade 9 Mathematics Provincial Achievement Test

General description

The *Grade 9 Mathematics Provincial Achievement Test* consists of two parts:

- **Part A** contains 20 questions and assesses students' foundational skills and fluency in mental math, estimation, algebra, square roots, exponent laws, and arithmetic operations on rational numbers without the use of calculators. The questions will be in various machine-scored formats supported by the digital assessment platform.
- **Part B** contains 40 questions and assesses students' ability to recall concepts and principles and to apply reasoning skills to solve problems. The questions will be in various multiple choice and numerical response formats supported by the digital assessment platform.

Questions are categorized according to three levels of complexity: low, moderate, and high. (See Appendix 1 for a detailed explanation of each complexity level.)

A dictionary, a thesaurus, or other reference materials are **not** permitted for students writing the test.

It is important to remember that one test cannot measure all the components within the learning outcomes in the mathematics curriculum.

Test administration

Part A is designed to be completed in 30 minutes; however, each student may have up to 60 minutes to complete this part, should they need it.

Part B is designed to be completed in 80 minutes; however, each student may have up to 160 minutes to complete this part, should they need it.

Any *Written-response bilingual blank paper* needed for rough work must be provided to students by the supervisor and collected by the supervisor at the end of the provincial achievement test administration and securely shredded. The *Multiplication Chart – 10 x 10* used as a regular accommodation is available in the digital assessment platform. The documents can be found in the Key educator resources section on the [Provincial Achievement Tests](#) web page.

Description of Grade 9 Mathematics provincial 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 [Grade 9 Mathematics 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 problems • use familiar problem-solving strategies to solve routine problems • connect and apply personal experiences and problem-solving strategies to solve routine problems • recall and apply mathematical concepts and operational terms to solve routine problems • apply computation skills and formal mathematics vocabularies to solve routine problems • recognize and describe numerical and non-numerical patterns • use semantic knowledge to construct correct mental representations of word problems • use logical processes to analyze and solve routine problems • recognize and use mathematical patterns to make predictions when solving routine problems • test 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 problems • use a variety of problem-solving strategies to solve novel problems • connect and apply personal experiences and strategies to check and verify solutions to novel problems • apply abstract-thinking skills to reframe mathematical concepts to solve novel problems • generate linguistic and non-linguistic representations of knowledge to solve novel problems • demonstrate fluency in working with patterns represented concretely, pictorially, or symbolically • use semantic knowledge to construct and reframe correct mental representations of word problems • use logical processes to analyze complex problems, reach conclusions, and justify or defend conclusions • recognize, extend, create, and use mathematical patterns to make and justify predictions when solving novel problems • make generalizations from patterns to reach conclusions

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.

The following calculator materials, properties, and/or configurations are **not** permitted in the provincial achievement test writing room:

- graphing calculator
- programmed memory content
- built-in notes, libraries, or formulae (e.g., definitions or explanations in alpha notation)
- upgraded or downloaded programs
- remote communication capabilities
- symbolic manipulation capabilities
- algebraic expression manipulation capabilities
- external (peripheral) devices and other support materials such as manuals, printed or electronic cards, printers, memory expansion chips or cards, external keyboards
- calculator cases

For solutions to questions using π , students may use the π button on a scientific calculator or the approximate value 3.14.

Use of a protractor 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., a ruler, tracing paper, pattern blocks, tiles and cubes, geoboards, tangrams, counters, spinners, number lines, graph paper). The manipulative cannot perform the mental conversion or provide the solution to a problem. A multiplication table is not an acceptable manipulative for use in completing *Part A* (except as an accommodation) or *Part B*.

Please refer to [Provincial Achievement Tests](#) for further information.

Scoring and reporting

Test scores will be available after students submit their tests on the digital assessment platform. 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.

Blueprints

Test Component	Number of Questions	Question Format	Weighting on Total Test
<i>Part A</i>	20	Numerical response	20%
<i>Part B</i>	32	Multiple choice	80%
	8	Numerical response	

Content Domain of Test (Strand)	<i>Part A:</i> Percentage of Questions	<i>Part B:</i> Percentage of Questions
Number	70–80%	25–35%
Patterns and Relations	20–30%	35–45%
Shape and Space		20–30%
Statistics and Probability		5–10%

Cognitive Domain of Test (Complexity Level)	<i>Part A:</i> Percentage of Questions	<i>Part B:</i> Percentage of Questions
Low	80–90%	30–40%
Moderate	10–20%	45–55%
High		10–20%

Preparing Students for the *Grade 9 Mathematics Provincial Achievement Test*

Suggestions for preparing students

The best way to prepare students for writing the provincial achievement test is to teach the mathematics program of studies 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 many 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 materials](#) from previously secured tests are available on the Alberta Education and Childcare website.

[Practice tests](#) are also available on the new digital assessment platform.

Special-format practice tests

To give students an opportunity to practice provincial achievement test-style questions and content in Braille, large print, or coloured print versions, Alberta Education and Childcare produces special-format practice tests for all subjects that have a provincial achievement test. Alberta schools with registered Alberta K–12 students may place orders for these tests. Braille versions 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 all students.

For the greatest benefit, special-format practice tests should be written under conditions similar to those of the corresponding provincial achievement test. The same rules regarding the use of resources and devices should be followed.

Braille versions must be returned to Alberta Education and Childcare after use.

More information about special format practice tests can be found in the *General Information Bulletin*. To order special format practice tests, complete this [form](#).

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. Flag 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 alternatives.
- Read all the alternatives and see which one best fits the answer.
- When you are not sure which answer is correct, eliminate any alternatives 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 all questions before submitting 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 questions 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 alternatives.
- When answering “best answer” questions, be sure to carefully read all choices before selecting the answer that you think is best. These questions will always include a boldfaced qualifier such as **best**, **most strongly**, or **most clearly** in their stems. More than one of the choices may be, to some degree, correct, but one of the choices 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 provincial achievement test questions are field tested before use. Field testing is a critical process in assessment design with the objective of testing the test items before they appear on a provincial assessment. Field testing ensures that Alberta Education and Childcare provincial assessments are fair, reliable, and valid. Teachers and students can be reassured that the items on provincial assessments have undergone a rigorous process of development, improvement, and validation.

Field tests provide benefits for teachers and students by exposing them to examples of the style and content of items that may appear on provincial assessments. Through the field-testing experience, students experience provincial assessment rules and procedures, as well as a conventional large-scale standardized writing environment. This exposure and familiarization have the potential to reduce test anxiety.

Teachers can sign up for field testing on the [digital assessment platform](#). A [user guide](#) to signing up for field testing has been developed to answer any questions you may have.

All of the rules and procedures that are specified in the [General Information Bulletin](#) apply to the administration of field tests. Prior to participating in field testing, school staff will be required to attest to a declaration related to assessment confidentiality.

Detailed information can be found in the [Field Testing Program: Rules and Guide](#).

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.

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.

To be eligible to serve on a working group, a teacher must currently be teaching the course in question or must have taught the course within the past three years.

Teachers participating in working groups are selected from the working-group nominees approved by superintendents of school jurisdictions. The call for nominations usually occurs in September. However, we will accept further nominations throughout the year. In some subjects, more teachers may be nominated for working groups than are needed. When teachers are selected, there must be a balance of first-time and experienced working-group members and regional representation by zone, school authority, and school. Unfortunately, not everyone whose name is submitted will be selected.

Appendix 1: Levels of Item Complexity

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 make 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 a 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 those in the low-complexity category. Moderate-complexity items 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 skills and knowledge from various domains. The following list illustrates some of the demands that items of moderate complexity may make 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 make 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.
-

Appendix 2: 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 $V = \pi r^2 h$

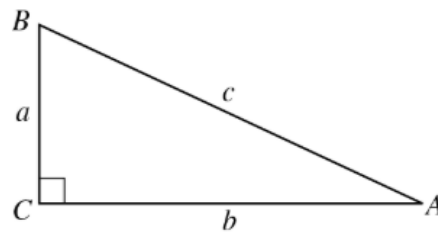
Prism $V = (\text{Base Area})(h)$

Circumference (C)

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

Pythagorean Theorem

$c^2 = a^2 + b^2$ where c is the hypotenuse



Appendix 3: Example of *Grade 9 Mathematics Part A* Instructions Page

Grade 9 Provincial Achievement Test *Mathematics* *Part A*

Description

Time: 30 minutes. This test was developed to be completed in 30 minutes. You have up to 60 minutes to complete this test should you need it.

This test consists of 20 questions, each worth 1 mark.

Instructions

- Review the “Try the Tools” instructions.
- You may use manipulatives; however, use of a calculator is **not** permitted.
- You may **not** use a dictionary, a thesaurus, or other reference material.
- Read each question carefully.
- If you change an answer, your test will be automatically updated.
- Answer every question.
- If an answer is a value between 0 and 1 (e.g., 0.25), then be sure to record the 0 before the decimal place.
- To submit your **final** answers, click “Submit” on the left side of the screen.
- You will **not** be able to return to the test once the test is submitted.

Copyright © 2025, the Crown in Right of Alberta, as represented by the Minister of Education and Childcare, Alberta Education and Childcare, Provincial Assessment Sector, 6th floor, 44 Capital Boulevard, 10044 108 Street NW, Edmonton, Alberta T5J 5E6, and its licensors. All rights reserved.

Duplication of this test in any manner or its use for purposes other than those authorized and scheduled by Alberta Education and Childcare is strictly prohibited.

The personal information collected through the Provincial Achievement Testing Program is for the purpose of administering the program as well as support programs, policy evaluation, and measurement. This collection is authorized by section 4(c) of the *Protection of Privacy Act*. For questions about the collection of personal information, email EDC.PATS@gov.ab.ca or by mail to 6th floor, 44 Capital Boulevard, 10044 108 Street NW, Edmonton, Alberta T5J 5E6.


Appendix 4: Example of *Grade 9 Mathematics Part B* Instructions Page

Grade 9 Provincial Achievement Test *Mathematics* *Part B*

Description

Time: 80 minutes. This test was developed to be completed in 80 minutes. You have up to 160 minutes to complete this test should you need it.

This test consists of 40 machine-scored questions, each worth one mark.

The formula sheet can be viewed by clicking the document icon  at the right side of the screen.

Instructions

- Review the “Try the Tools” instructions.
- You may use a ruler, manipulatives, and a calculator; however, a graphing calculator is **not** permitted. Use of a protractor is also **not** permitted.
- You may **not** use a dictionary, a thesaurus, or other reference material.
- Read each question carefully, and choose the **correct** or **best** answer.
- If you change an answer, your test will be automatically updated.
- Answer every question.
- If an answer is a value between 0 and 1 (e.g., 0.25), then be sure to record the 0 before the decimal place.
- To submit your **final** answers, click “Submit” on the left side of the screen.
- You will **not** be able to return to the test once the test is submitted.

Copyright © 2025, the Crown in Right of Alberta, as represented by the Minister of Education and Childcare, Alberta Education and Childcare, Provincial Assessment Sector, 6th floor, 44 Capital Boulevard, 10044 108 Street NW, Edmonton, Alberta T5J 5E6, and its licensors. All rights reserved.

Duplication of this test in any manner or its use for purposes other than those authorized and scheduled by Alberta Education and Childcare is strictly prohibited.

The personal information collected through the Provincial Achievement Testing Program is for the purpose of administering the program as well as support programs, policy evaluation, and measurement. This collection is authorized by section 4(c) of the *Protection of Privacy Act*. For questions about the collection of personal information, email EDC.PATS@gov.ab.ca or by mail to 6th floor, 44 Capital Boulevard, 10044 108 Street NW, Edmonton, Alberta T5J 5E6.

Appendix 5: Examples of Descriptions for Text to Speech on the *Mathematics 9 Provincial Achievement Test*

This appendix has been prepared by Alberta Education and Childcare Provincial Assessment staff. Its purpose is to provide school staff with examples of the descriptions of diagrams, illustrations, and visuals used in provincial achievement test audio versions, which are available to students as an accommodation. These examples are neither exhaustive nor prescriptive. Test content is shown in black text and descriptions in blue text.

For students who are enrolled with a school and who typically use audio for their coursework, no application is required to receive this accommodation when writing provincial achievement tests.

Scripting notes are written to describe sources that contain more than just text. Visual sources are described to maintain fairness for all students. However, some visual sources are not scripted, as students may be required to visually analyze a source to determine trends or extrapolate a conclusion. In these situations, the scripting notes would instruct students to examine the digital version of the test.

Units

Unit	Read as
s	seconds
min	minutes
h	hours
m	metres
cm ²	square centimetres
m ³	cubic metres
L	litres
mL	millilitres
g	grams
mg	milligrams
m/s	metres per second
km/h	kilometres per hour
°C	degrees Celsius
\$1.25	one dollar and twenty-five cents

Numerical values

Numerical Value	Read as
183.48	one hundred eighty-three decimal four eight
2 321	two thousand three hundred twenty-one
$\frac{3}{5}$	three over five
-5	negative five
$\frac{6+3}{2}$	six plus three all over two
π	pi

Note: Common fractions, such as $\frac{1}{2}$, may be read as “one over two” or “one half.”

Symbols and notation

Symbol	Read as
+	plus
-	minus
×	times
÷	divided by
=	equals or is equal to
a^2	a squared
b^3	b cubed
c^4	c to the exponent four
$(2n + 1)$	open bracket, two n plus one, closed bracket
$x > 0$	x is greater than zero
$x \leq 0$	x is less than or equal to zero
$x = 0$	x is equal to zero
$\sqrt{\frac{16}{9}}$	the square root of (pause) sixteen over nine
$\frac{\sqrt{16}}{9}$	the square root of sixteen all over nine
15:64	fifteen to sixty-four

Note: Commas are to be read only when reading ordered pairs.

Tables

Introduce the table starting with the title, if there is one, and then identify the number of columns and rows. Tables can be read in two different ways. One way is to list the column headings and any corresponding units first. Next, read across each row from left to right, stating the column heading before reading the data in each cell. Read empty spaces in tables as “blank.”

Number of People (n)	Cost (c)
2	\$55.00
4	\$64.50
6	\$74.00
8	\$83.50

There is a table with two columns and four rows. The column headings are “Number of People, n ” and “Cost, c .”

Number of People: two; Cost: fifty-five dollars and zero cents

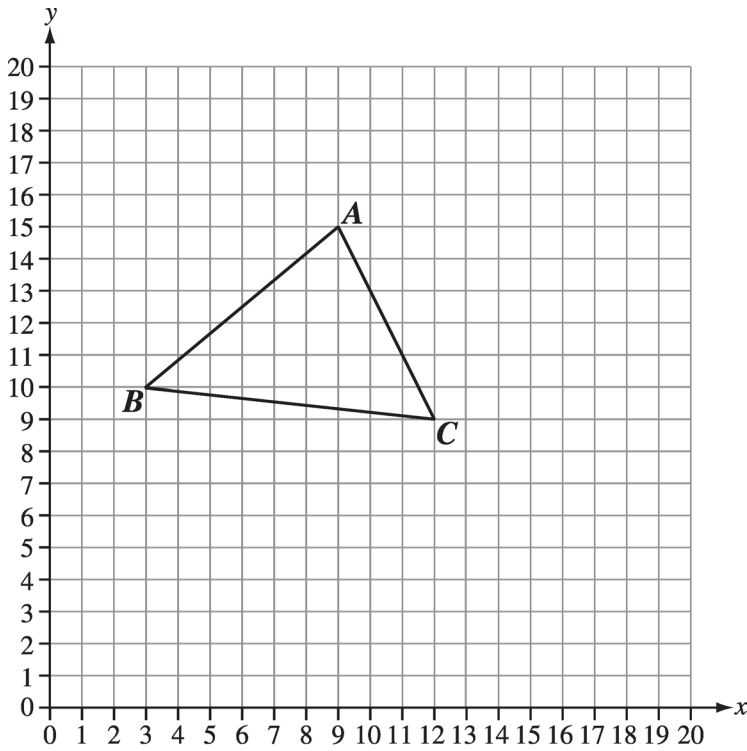
Number of People: four; Cost: sixty-four dollars and fifty cents

Number of People: six; Cost: seventy-four dollars and zero cents

Number of People: eight; Cost: eighty-three dollars and fifty cents

Graphs

Introduce the graph starting with the title, if there is one, and then describe the labels and scales for the horizontal axis and the vertical axis. If there are no marks or scale on the axis, state this. When there are four graphs for each of the multiple-choice options (A, B, C, and D), describe the labels and scales for the similarities between the graphs, such as the horizontal axis and the vertical axis, and then describe the shape of the line for each of the choices.



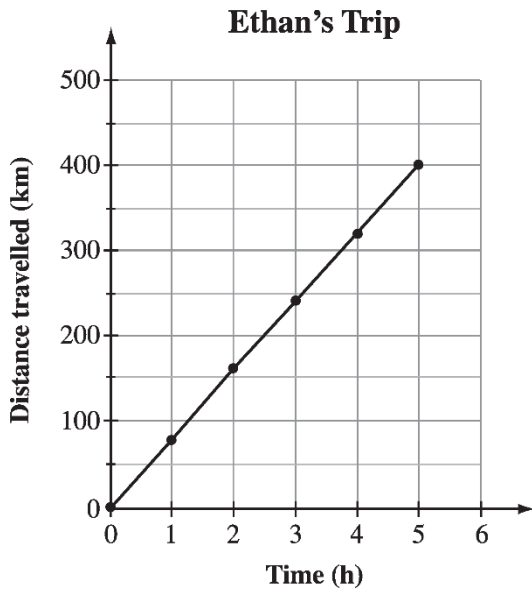
There is a grid representing the first quadrant of the Cartesian plane. The horizontal axis and vertical axis are scaled from zero to twenty, marked and labelled in increments of one. Triangle ABC is located on the grid.

Point A is located at nine comma fifteen.

Point B is located at three comma ten.

Point C is located at twelve comma nine.

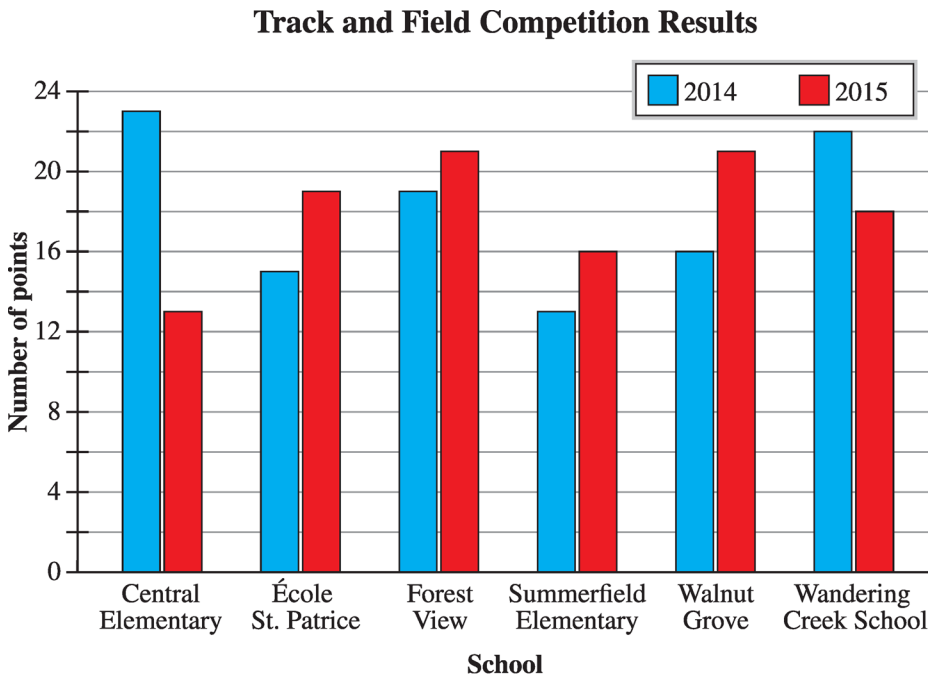
Line graphs



There is a line graph titled “Ethan’s Trip.” The horizontal axis is labelled “Time” in hours, scaled from zero to six, marked and labelled in increments of one. The vertical axis is labelled “Distance travelled” in kilometres, scaled from zero to five hundred, marked in increments of fifty and labelled in increments of one hundred. The dots have been connected in order by straight lines.

Bar graphs

Introduce the graph starting with the title, and then describe the label for the horizontal axis. List the label for each bar, and then describe the label and scale for the vertical axis. Describe the legend if available.

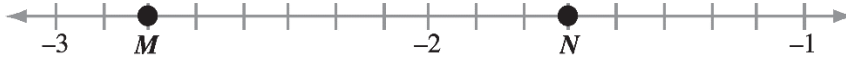


There is a double bar graph titled “Track and Field Competition Results.” The horizontal axis is labelled “School”, and from left to right the bars are labelled “Central Elementary,” “École St. Patrice,” “Forest View,” “Summerfield Elementary,” “Walnut Grove,” and “Wandering Creek School.” The vertical axis is labelled “Number of points,” scaled from zero to twenty-four, marked in increments of two and labelled in increments of four.

Two bar graphs are shown. A legend shows that the blue bar graph represents 2014 and the red bar graph represents 2015.

Number lines

Introduce the number line by describing the tick marks and arrows. Identify if it has open or solid, closed circles and their locations.



There is a diagram of a number line that has arrows at each end with two labelled points indicated by solid, closed circles. The number line is marked and labelled, reading from left to right, negative three, negative two, negative one; and there are seven tick marks between each label. Point M is located two tick marks to the right of negative three. Point N is located three tick marks to the right of negative two.

Numerical-response blanks

Order:	_____	_____	_____	_____
Rational Number:	$\sqrt{\frac{9}{25}}$	$\frac{3}{4}$	$(0.7)^2$	$0.7\bar{5}$

Order: Blank one; Rational Number: the square root of (pause) nine over twenty-five

Blank two: three over four

Blank three: open bracket, zero decimal seven, closed bracket, exponent two

Blank four: zero decimal seven five with a bar over the digit five

Provincial Assessment Contacts

Provincial Achievement Tests Help Desk

Email: EDC.PATS@gov.ab.ca

Literacy & Numeracy Screenings Help Desk

Email: litnumscreening@gov.ab.ca

Provincial Assessment mailing address

Provincial Assessment, Alberta Education and Childcare
44 Capital Boulevard
10044 108 Street NW
Edmonton AB T5J 5E6

Alberta Education and Childcare website alberta.ca/education-and-childcare

Online Assessment (for technical assistance)

Email: online.assessment@gov.ab.ca

Office hours:

Monday through Friday, 8:15 a.m. to 4:30 p.m.