

Grade 9 Assessment of Mathematics, 2002–2003

Applied Booklet 2




Education
Quality and
Accountability
Office

Directions to Students About Answering Tasks

1. For this part of the assessment, make sure you have the following items along with *Booklet 2*:
 - a pencil and an eraser or a pen
 - a scientific or graphing calculator
 - a ruler and a protractor
2. Do all of your work (even your rough work) in *Booklet 2*.
3. You will work in the booklet on two different days. Each day you will have 40 min to do 3 tasks. Allow about 15 min for each of the first two tasks and about 10 min for the third. Give yourself time to answer all of the questions.
4. Figures in this section are not drawn to scale.
5. The tasks are designed to allow you an opportunity to show what you know and what you can do. Provide as much information as you can to show your understanding. Your teacher may be marking some of your work. In addition, someone who does not know your work will mark all of it, including what your teacher has marked. So, you must provide clear, well-organized answers to illustrate your complete understanding and ability to communicate in mathematics.
6. Make sure you follow directions from the Key Words and Phrases in Instructions sheet. It is provided for you so you will know the kind of question that is being asked.

For example, the question might ask you to “**Show your work.**” Read the Key Words and Phrases in Instructions sheet. It says to record all calculations. If you use your calculator, you need to show what calculations you do. If you sketch a graph in the process of getting to your solution, show the sketch and label it. Use proper and correct mathematical conventions when you present your work.
7. When using a calculator, write down the numbers and operations that you carried out on the calculator.

For example: Find the area of a circle with a diameter of 7 cm.

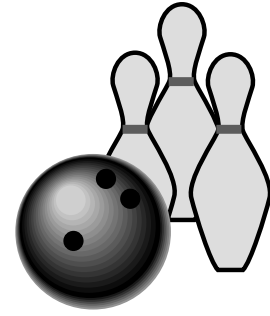
You need to write $A = \pi(3.5)^2$ as well as the answer you got on your calculator.
8. There are always many different ways to solve a problem. Use your broad range of mathematical knowledge to present a complete and creative solution to each question.
9. You have **40 min** to work.
10. When you see the  sign, you have completed the work for the day. Check your answers. Then wait quietly for directions from your teacher.

Task 1: Bowling!

A group of 4 friends is going bowling at **Bowling Bonanza**.

Bowling Bonanza charges

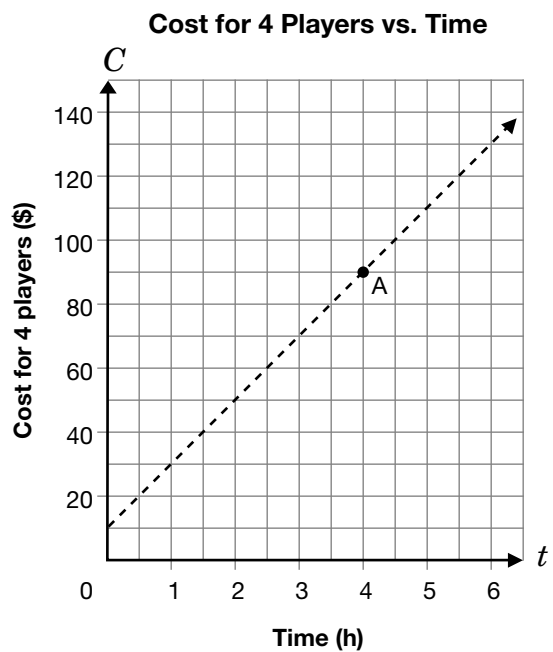
- \$2.50 for each player to rent shoes
plus
- \$20/h for a group of 4 to bowl.



a) The graph below represents the relationship between cost, C , in dollars, and time, t , in hours, for 4 players to bowl.

i) **Write the coordinates** of point A.

ii) **Explain** what the coordinates of point A tell you about the cost of bowling.



b) **Explain** how this graph would change if the cost for renting the shoes increased.

Hint:
Refer to slope and y-intercept.

c) Circle the equation that represents the graph in question a).

$$C = 20t + 10$$

$$C = 20t^2 + 10$$

$$C = \frac{20}{t} + 10$$

Give reasons for your answer.

d) This group of friends wants to spend \$80.

How many hours can they bowl at **Bowling Bonanza?**

Give reasons for your answer or show your work.

e) William **and** his 3 friends are going bowling.

He finds an advertisement in the newspaper for a new bowling alley, **Super Bowl**.

William and his friends will play 6 games in 3 hours.

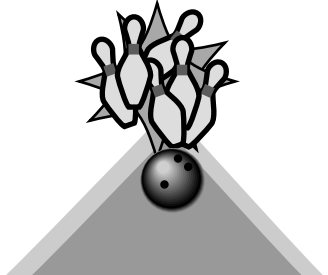
Determine whether William and his friends should go bowling at **Bowling Bonanza** or **Super Bowl**. Use the information given in the advertisement and in the hint box.

Give reasons for your answer.

Super Bowl

- Free bowling shoes
- Each player pays \$3.00 per game

Call 555-BOWL and book your lane today.



Hint:

Bowling Bonanza charges

- \$2.50 for each player to rent shoes and
- \$20/h for a group of 4 to bowl.

Task 2: Reading Is Fundamental

A survey is taken at a secondary school to determine the number of minutes per week that students spend reading for leisure.

The following times in minutes are collected from 10 students.

425, 45, 68, 90, 30, 15, 10, 70, 30, 45



a) **Calculate** the mean, the median and the mode. **Show your work.**

b) **Explain** why the mean is **not** the measure that best represents the typical time spent reading.

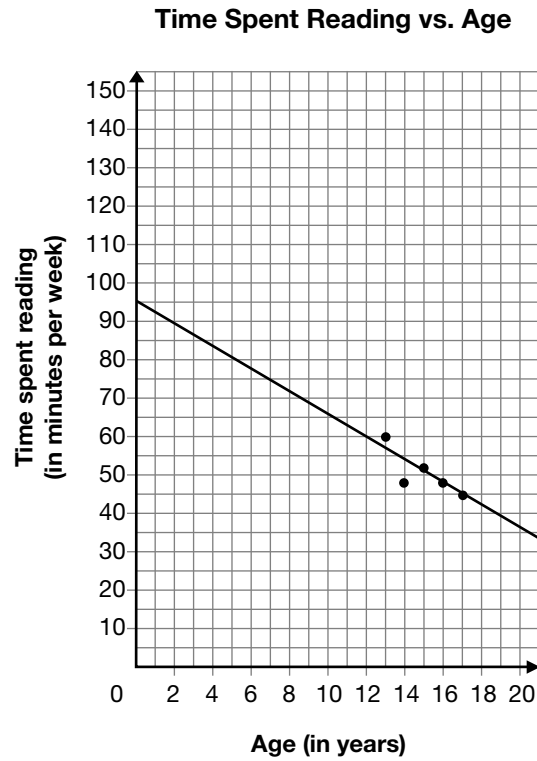
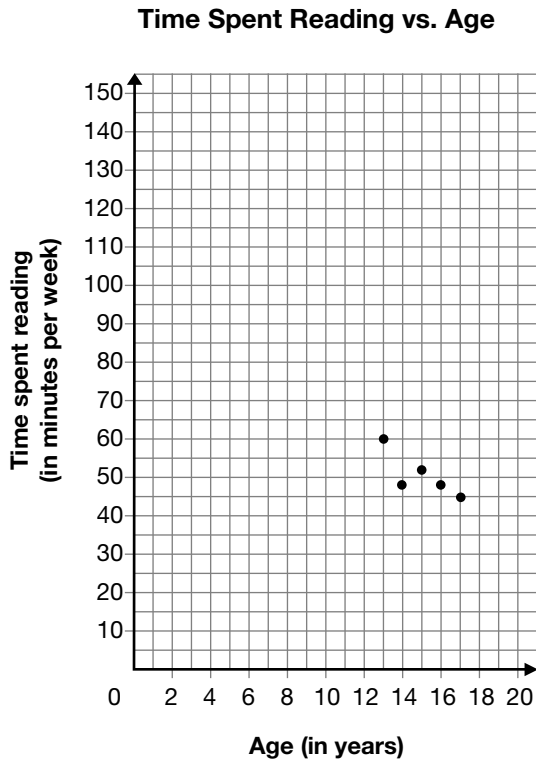
- c) Aaron surveys 10 students from a Grade 10 boys' phys. ed. class. Aaron's teacher says, "That's not a good sample of the entire school population, because you asked only Grade 10 students."
List other reasons why Aaron's sample does not represent the entire school population.

- d) The following table shows the number of students and the percent of students in each grade.
Calculate the missing entries. **Show your work.**

Grade	9	10	11	12	Total
Number of Students	210	190	196	184	
Percent of total	$\frac{210}{780} \times 100\%$ = 27%				

- e) Each grade is to be represented in the same proportion as the school population. Two hundred students will be surveyed. **Calculate** the number of Grade 11 students that should be surveyed. **Show your work.**

- f) The information shown on the graph has been collected by Aaron's class. It shows the average number of minutes of reading per week for each age surveyed. Aaron decides to draw a line of best fit.



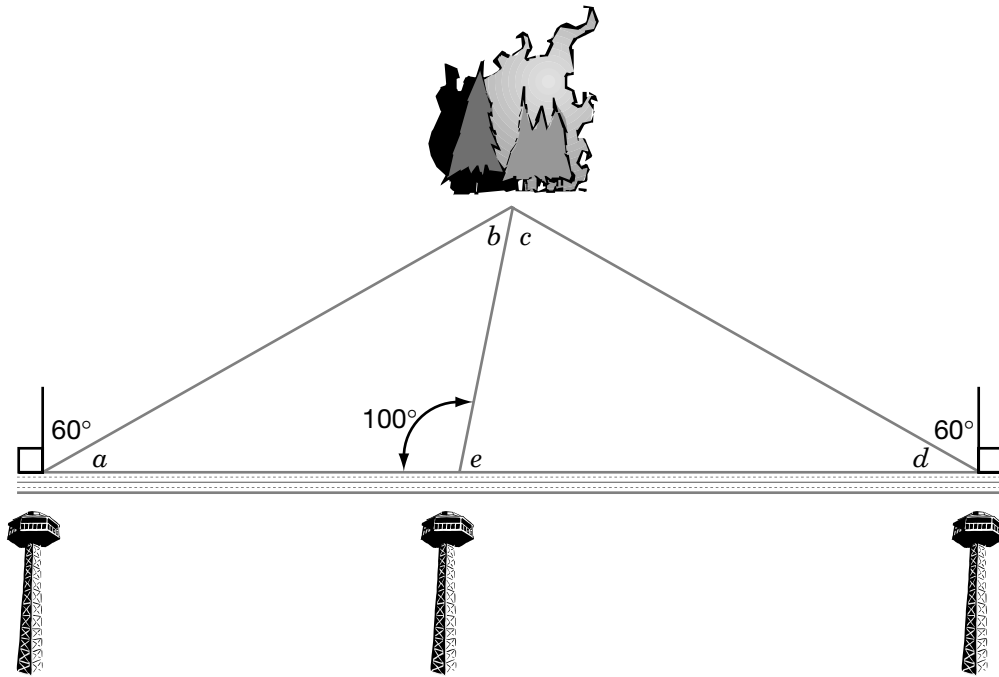
- i) Use Aaron's line of best fit to **determine** the amount of time a two-year-old child spends reading.

- ii) **Explain** why a line of best fit is **not** a realistic way to represent this relationship.

Task 3: Forest Fires

Three forest ranger stations are located along a road. The ranger in each of the stations spots a fire.

The diagram below shows the positions of the stations as well as the location of the fire.



a) Calculate the value of a . Show your work.

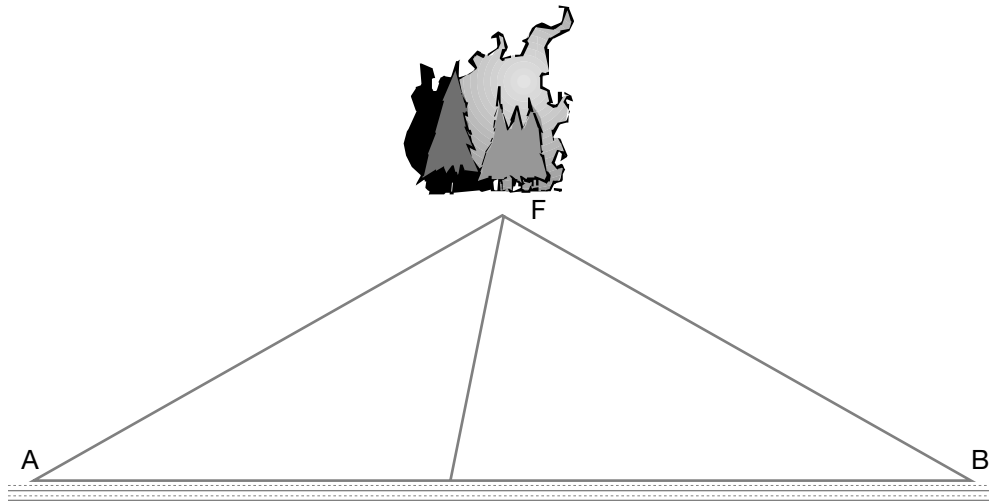
b) Calculate the value of b . Show your work.

c) Determine the value of c . Give reasons for your answer.

- d) The three rangers spot another fire on the other side of the road. They notice that a straight line between the fires intersects the road at 90° . Also, each fire is the same distance from the road.

Do the following on the diagram below to locate the second fire:

- Draw a straight line through **F** that intersects the road at approximately 90° .
- Label the point where the line intersects the road **P**.
- Extend the line past the road to a point **G**, making $FP = PG$.
- The second fire is located at **G**.



e) Join **G** to **A** and **G** to **B**.

i) What type of shape is **AGBF**?

ii) **List** the measurements you could take to support your answer.

Hint:

Include measurements related to sides, angles and diagonals.

