

Grade 9 Assessment of Mathematics, 2003–2004

Applied Program

Release Items

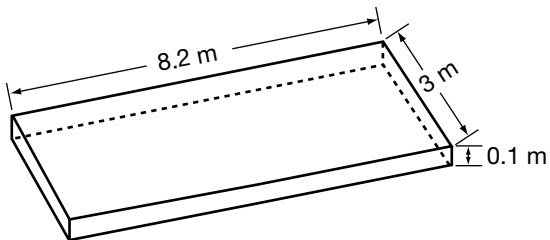


Education
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Multiple-Choice Questions

1. Richard wants to buy new soil for his garden. He wants the new soil to be approximately 0.1 m deep.

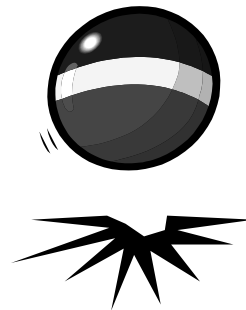
The figure shows the dimensions of Richard's garden, which is a **rectangular prism**.



What **volume** of soil does Richard need?

- A 2.24 m³
 - B 2.46 m³
 - C 11.3 m³
 - D 24.6 m³
2. Given A (2, 5) and B (-6, 5), which statement about the line segment AB is **true**?
- F The slope of AB is zero.
 - G The slope of AB is positive.
 - H The slope of AB is negative.
 - J The slope of AB is undefined.

3. A ball is dropped from a height of 10 m above the ground. It bounces to **90% of its previous height** on each bounce.



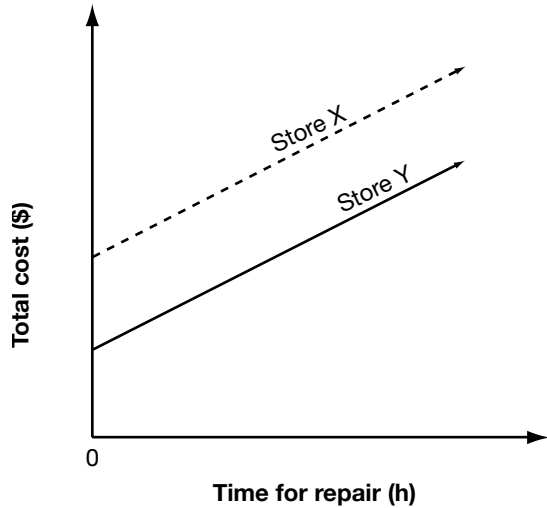
What is the approximate height that the ball bounces to on the **fourth** bounce?

- A 2.8 m
- B 4.3 m
- C 6.6 m
- D 7.2 m

4. Two bicycle repair stores charge an initial fee and an hourly rate for repairs.

The graph below shows the total cost of repairs versus time for the repair.

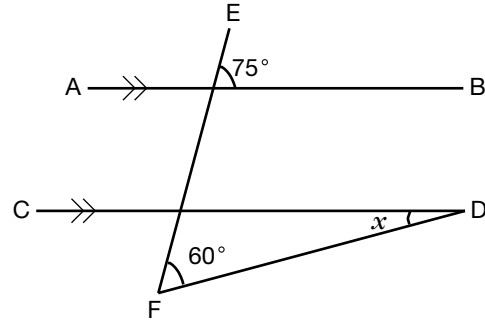
Total Cost vs. Time for Repair



Which statement is **true**?

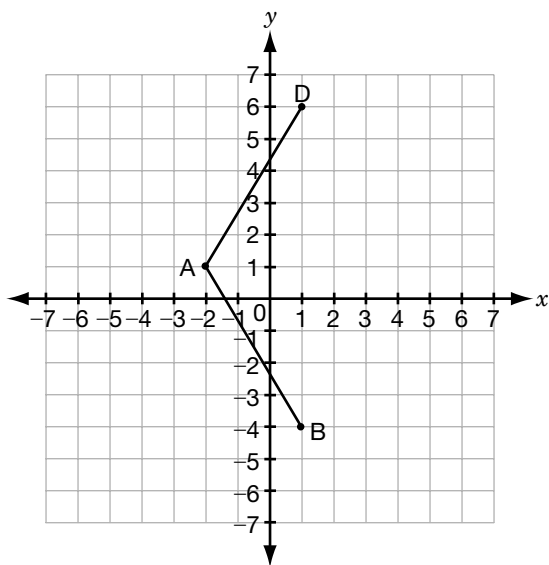
- F The two stores charge different hourly rates and the same initial fee.
- G The two stores charge the same hourly rate and different initial fees.
- H The two stores charge different hourly rates and different initial fees.
- J The two stores charge the same hourly rate and the same initial fee.

5. What is the value of x ?



- A 15°
- B 30°
- C 45°
- D 60°

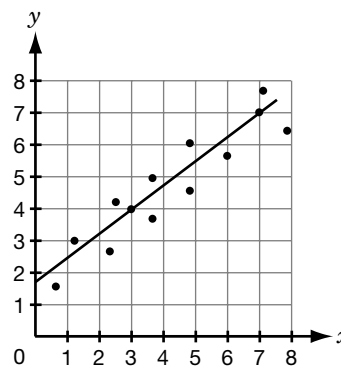
6. A is the point $(-2, 1)$, B is the point $(1, -4)$ and D is the point $(1, 6)$.



If ABCD is a **rhombus**, which of the following is **point C**?

- F $(1, 1)$
- G $(1, 4)$
- H $(4, 1)$
- J $(4, 4)$

7. The graph shows a scatter plot and a line of best fit.



Which of the following statements about the line of best fit is **true**?

- A The line has a negative slope and a negative y -intercept.
- B The line has a negative slope and a positive y -intercept.
- C The line has a positive slope and a negative y -intercept.
- D The line has a positive slope and a positive y -intercept.

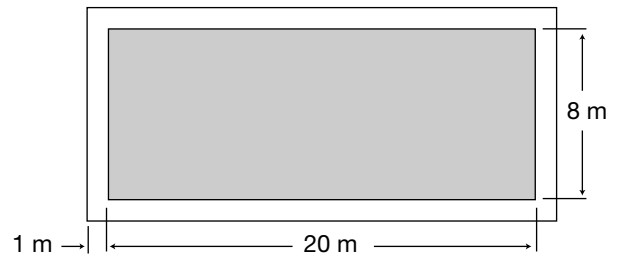
8. Nilima works at a daycare. Her daily salary can be calculated using the formula $S = 5c + 8t$. S represents her daily salary, c represents the number of children she watches and t represents the number of hours she works.



What is Nilima's daily salary if she watches 3 children and works for 6 hours?

- F \$54
- G \$63
- H \$72
- J \$117

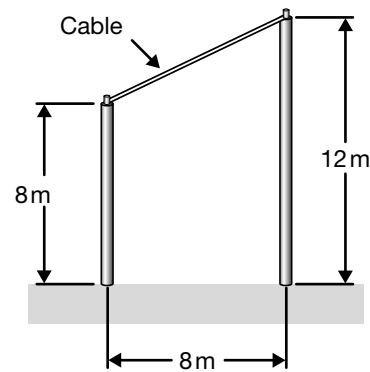
9. A rectangular swimming pool is **20 m** long and **8 m** wide. The pool is surrounded by a path that is **1 m** wide.



What is the **area** of the path?

- A 24 m^2
- B 28 m^2
- C 56 m^2
- D 60 m^2

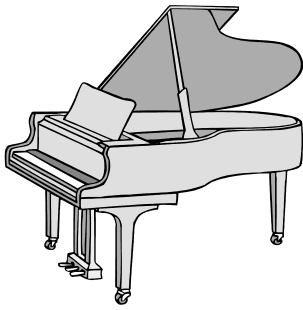
10. Two vertical poles are connected by a cable, as shown.



What is the **slope** of the cable?

- F $\frac{1}{2}$
- G $\frac{2}{3}$
- H $\frac{3}{2}$
- J 2

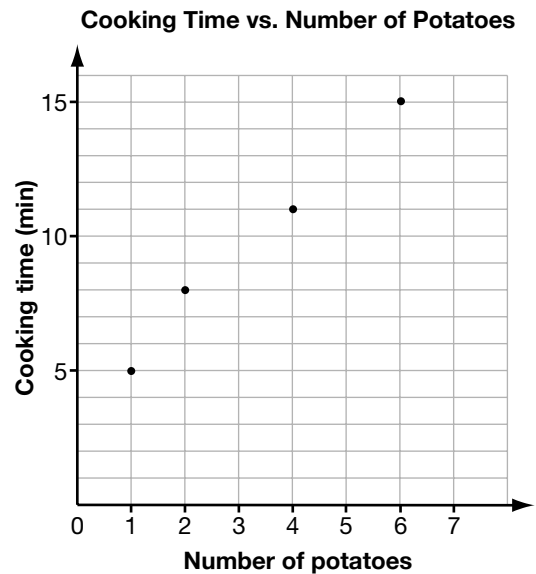
11. There are 88 keys on a piano. Some keys are black and some keys are white.



If x represents the number of white keys, which expression below represents the number of black keys?

- A $x - 88$
- B $x + 88$
- C $88 - x$
- D $\frac{88}{x}$

12. The graph below shows the relationship between the cooking time required to bake potatoes in a microwave and the number of potatoes.



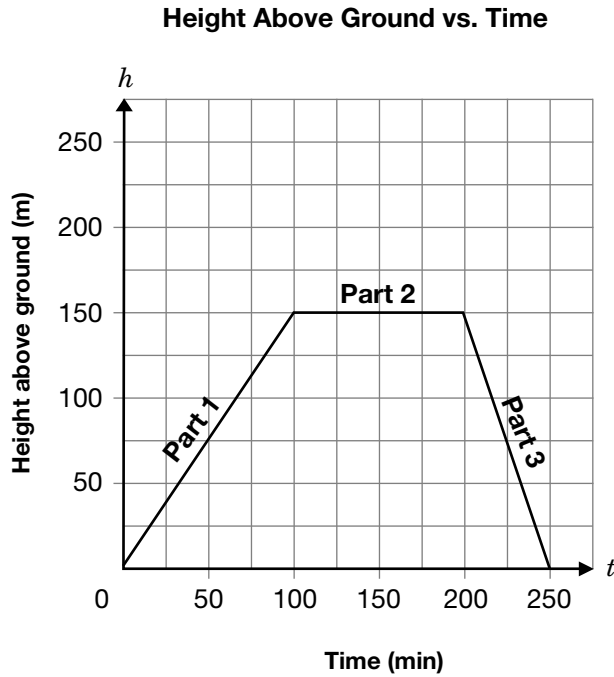
Which statement best describes this relationship?

- F As the number of potatoes increases, the cooking time also increases.
- G If the number of potatoes is doubled, the cooking time also doubles.
- H An additional 5 min of cooking time is required for each additional potato.
- J The time required to bake potatoes is 2 min, plus 3 min for each potato.

Short-Answer Questions

2.1 Terri is a rock climber.

The graph below shows the relationship between her height in metres above the ground and the time in minutes she spends climbing.



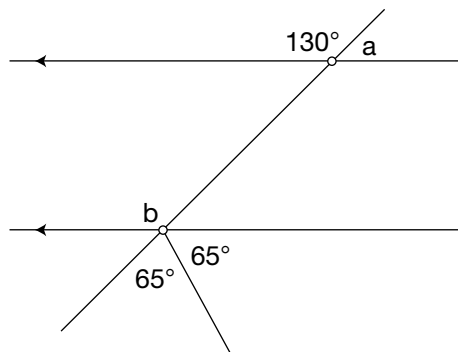
In the table below, **describe** Terri's climb.

Hint: Use words like

- direction
- distance
- time
- speed

Section of graph	Description
Part 1	
Part 2	
Part 3	

2.2 Determine the measures of $\angle a$ and $\angle b$.



In the table below, give reasons for your answers or show your calculations.

	Reasons or calculations
$\angle a =$ _____	
$\angle b =$ _____	

2.3 Ron changes oil at an automobile repair shop.

Each day he works, he receives \$30, plus \$2 for every oil change he completes.

He thinks that he could calculate his daily pay using the equation $y = 30x + 2$ where y represents his pay, in dollars, and x represents the number of oil changes he completes that day.



Explain why his equation is **incorrect**.

Tasks

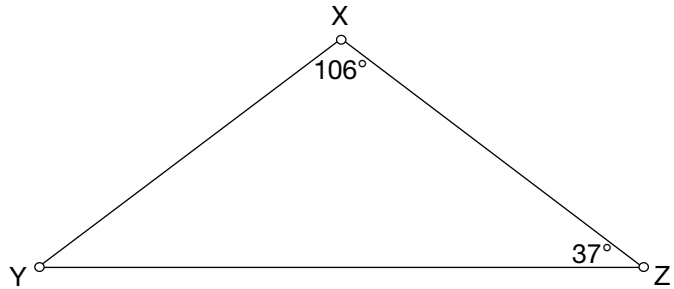
2.4 Everyone's a Winner with Math!

The math department has organized a contest.
Try the questions below.

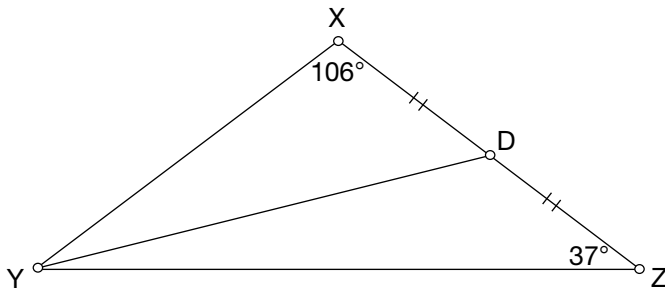
a) What **type of triangle** is $\triangle XYZ$?

- Check one: equilateral
 isosceles
 scalene

Give reasons for your answer.

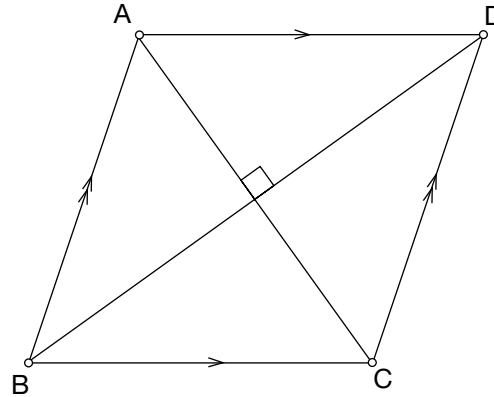


b) Line segment YD is a **median** from vertex Y.

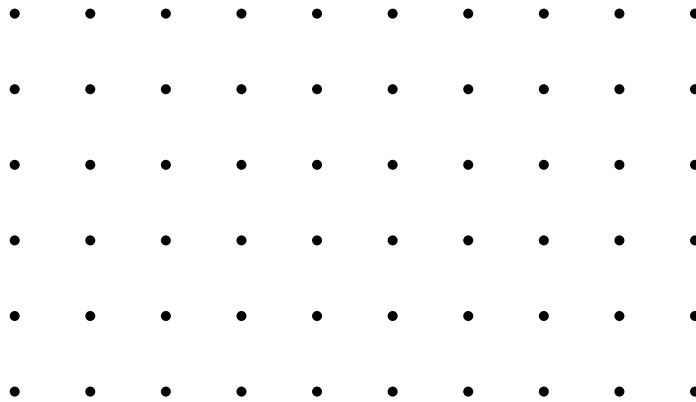


Draw the other **two medians** in the triangle and label the **point of intersection**.

c) The diagram below shows a **parallelogram** with diagonals that are **perpendicular**.



Draw a **quadrilateral** that has **perpendicular diagonals** but is **not** a parallelogram.



d) Pick up your prize for the contest.

Solve the **equation** below to find the number of the prize room:

$$3(2x - 9) - 4x = 13$$

2.5 Track and Field Tessa

Tessa runs on the track every day.

She runs one lap on Monday, two laps on Tuesday, three laps on Wednesday and so on. She wants to know how many laps she runs altogether in a month.

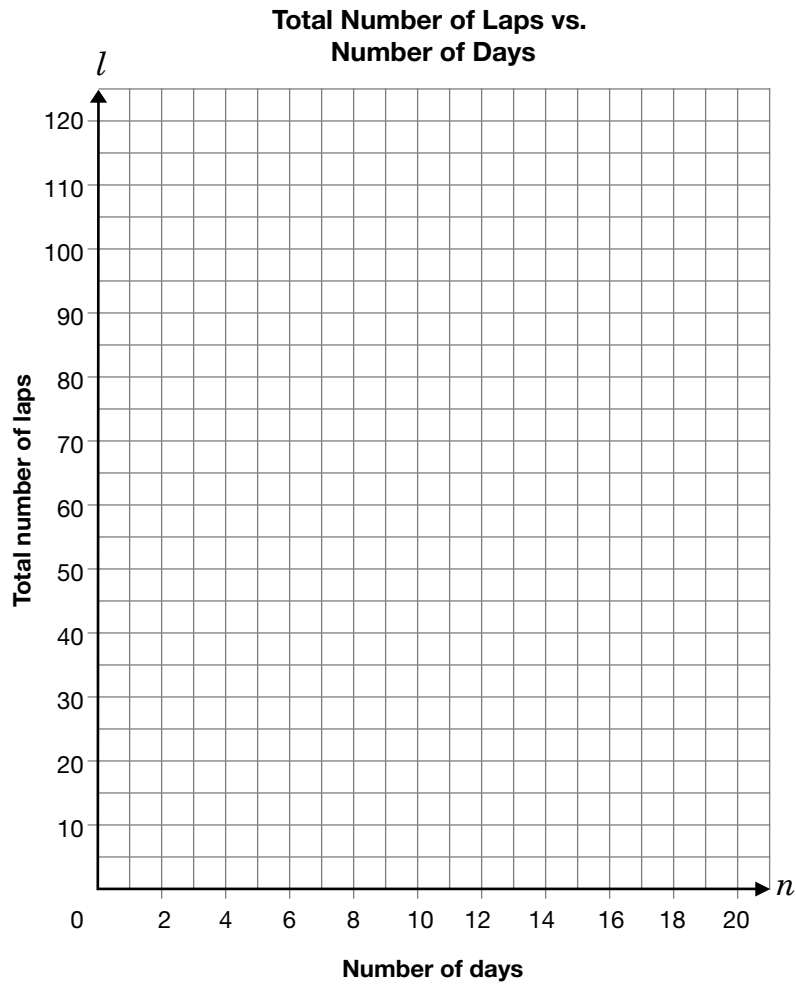


- a) The chart below shows the relationship between the total number of laps Tessa runs, l , and the number of days, n .

Complete the chart below.

Number of days, n	Total number of laps, l
1	1
2	$2 + 1 = 3$
3	$3 + 3 = 6$
4	$4 + 6 = \square$
5	$5 + \square = \square$
6	$6 + \square = \square$
7	$7 + \square = \square$
8	$8 + \square = \square$

b) Graph the information from question a) on the grid below.



c) Is the graph linear or non-linear?

Check one: linear or non-linear

Justify your answer.

- d) The total number of laps Tessa has run, l , after any number of days, n , is given by the formula

$$l = \frac{n(n + 1)}{2}$$

Use this formula to determine **the total number of laps** Tessa will have run after **30 days**.

- e) Maria says that it will take **15 days** for Tessa to run a total of **120 laps**. Do you agree?

Check one: agree or disagree

Justify your answer.

2.6 Global Proportions

The **Golden Globe Company** manufactures and sells globes to schools. The globes are in the shape of a **sphere** and have a **radius of 25 cm**.

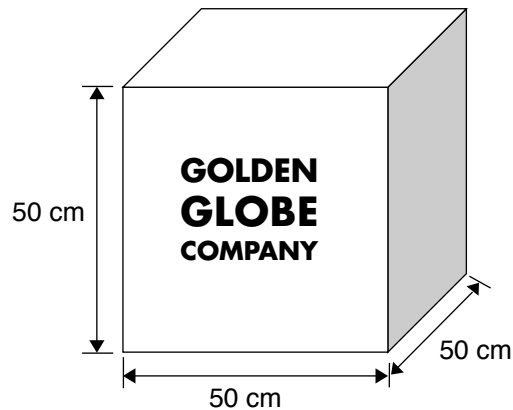


- a) Calculate the **volume** of a globe.

Hint:

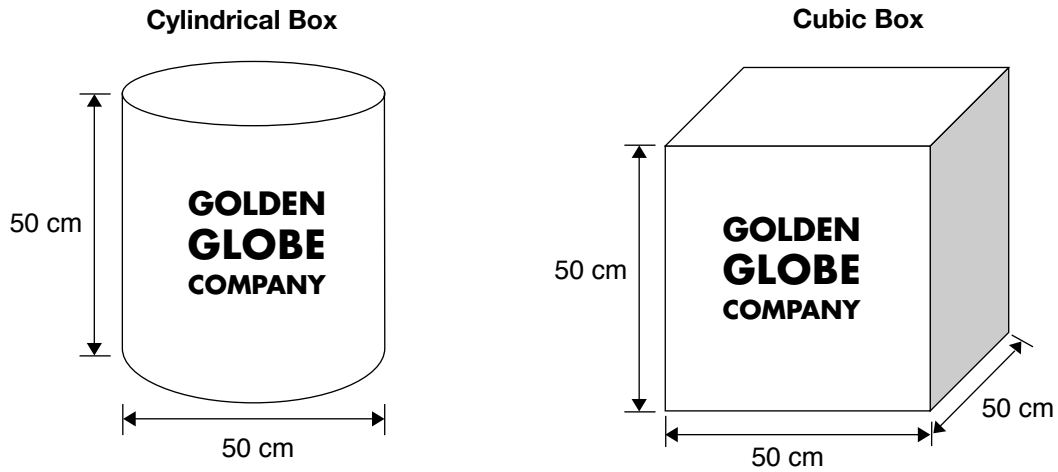
$$V = \frac{4}{3}\pi r^3$$

- b) Each globe is shipped in a **cubic box** that is the shape of a **rectangular prism**. The dimensions are shown below.



- i) Calculate the **volume** of the empty cubic box.
- ii) Determine the amount of empty space in the cubic box when there is a globe in it. Show your work.

- c) Jeremy sells globes. He designs a new box in the shape of a cylinder.
The globe fits in the cylindrical box better than in the cubic box. There is less empty space.



Which box requires **less cardboard** to make?

Check one: cylindrical box or cubic box

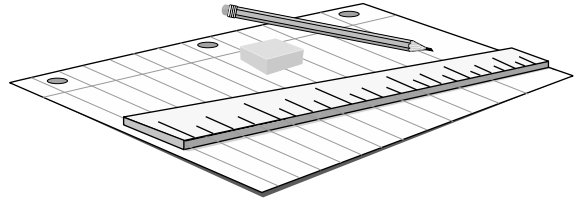
Show your work.

Hint:
Use your formula sheet.

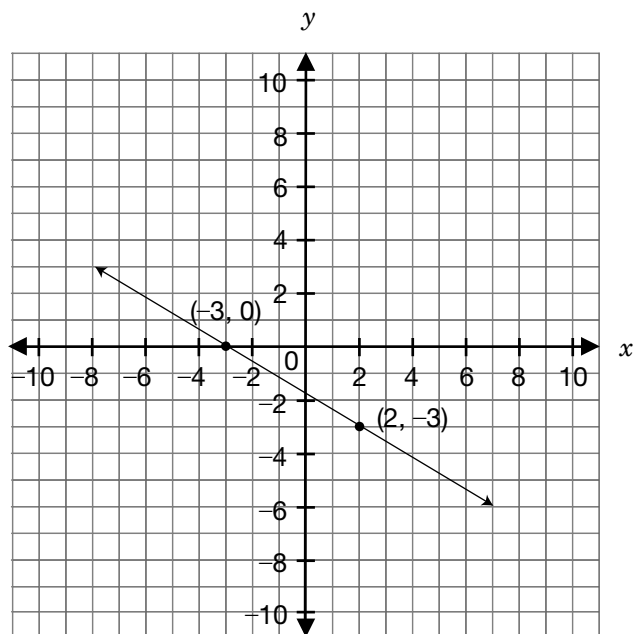
Short-Answer Questions

2.7 Expand and simplify.

$$2(3x^2 - 5x) + 4x(7 + x)$$



2.8 Determine the **slope** of the line shown on the grid below.
Show your work.





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