



**MATHEMATICS COMMON PAPER 2019**

**GRADE 9 TEST**

**TERM 3**

**MARKS: 100**

**TIME: 2 HOURS**

<b>CIRCUIT</b>		<b>DATE</b>	
<b>SCHOOL</b>			
<b>CLASS (e.g. 9 A)</b>			
<b>NAME &amp; SURNAME</b>			

**GENDER (✓)**

**DATE OF BIRTH**

BOY	GIRL
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y	y	y	y	m	m	d	d
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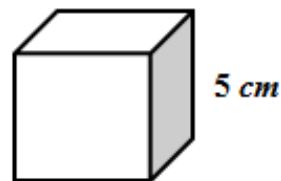
**Instructions to learners:**

1. Read all instructions carefully.
2. Question 1 consists of multiple choice questions. Circle the letter next to the correct answer.
3. Answer Question 2 – 6 in the spaces or frames provided.
4. Show all working (where necessary).
5. The programmable calculators may not be used.
6. Write neatly and legibly.

**QUESTION 1****[10]**

Circle the letter next to the correct answer.

- 1.1 What is the value of  $2x^2 + 4x + 3$  if  $x = 2$ ? (1)  
**A.** 19      **B.** 15      **C.** 9      **D.** 3
- 1.2 Solve for  $k$  in  $k^2 = 36$  (1)  
**A.** 4      **B.** 6      **C.** 9      **D.** 12
- 1.3 Solve for  $x$  in  $3^x = 81$  (1)  
**A.** 4      **B.** 9      **C.** 3      **D.** 27
- 1.4 A third of  $y$  minus 3 is equal to 3. What is the value of  $y$ ? (1)  
**A.** 0      **B.** 2      **C.** 9      **D.** 18
- 1.5 If  $(x - 1)(x + 2) = 0$ , then  $x =$   
**A.**  $-1$  or  $2$       **B.**  $1$  or  $-2$       **C.** 1      **D.**  $-2$
- 1.6 The factors of  $16p^2 - 49q^2$  are (1)  
**A.**  $(4p + 7q)(4p - 7q)$       **C.**  $(4p - 7q)$   
**B.**  $(4p + 7q)(4p + 7q)$       **D.**  $(4p - 7q)(4p - 7q)$
- 1.7 A polygon can be defined as: (1)  
**A.** A closed three-dimensional shape with straight sides  
**B.** A closed two-dimensional shape with three or more sides  
**C.** A closed plain figure with straight sides  
**D.** A closed figure with length, width and height
- 1.8 What is the total surface area of a cube with a side length of  $5\text{ cm}$ ? (1)



- A.** 25      **B.** 75      **C.** 100      **D.** 150

- 1.9 The height of a cube with a volume of  $64\text{ cm}^3$  is ... (1)

- A.** 16 cm      **B.** 8 cm      **C.** 4 cm      **D.** 32 cm

1.10 The table below shows the number of days a certain number of men will take to complete a task. (1)

Number of men	1	5	10	15
Time taken in hours	20	4	x	$\frac{4}{3}$

The value of x is:

- A.** 200      **B.** 2      **C.**  $\frac{4}{5}$       **D.** 8

**QUESTION 2**

**[27]**

2.1 Factorise fully.

2.1.1  $2x^2 - 162$  (3)

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2.1.2  $x^2 - 16x + 64$  (2)

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2.2 Simplify the following expressions.

2.2.1  $4x(3x^2 - 9x + 15)$  (3)

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2.2.2  $\frac{6x^3 - 8x^2 + 2x + 10}{2x}$  (4)

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2.2.3  $2(x + 3)^2 + 4(x - 3)(x + 5)$  (6)

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2.2.4  $\frac{4x^2 - 1}{4x^2 + 4x + 1}$  (5)

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2.3 Calculate the value of: (4)

$abc - a^3 + b^2 - c$  if  $a = -2; b = 3$  and  $c = 2$

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**QUESTION 3**

**[17]**

Solve the following equations.

3.1  $x^2 - 3x = 0$

(4)

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3.2  $(x - 1)^2 = x + 5$

(5)

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3.3  $\frac{2}{x} + 3 = -1; x \neq 0$

(4)

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3.4 The length of a rectangle is 6cm more than its width. The area of a rectangle is  $216\text{cm}^2$ . What are the dimensions of this rectangle?

(4)

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**QUESTION 4**

**[13]**

4.1 Complete the following table for x- and y- values for the equation:  $y = x^2 - 1$  (2)

<b>x</b>	-3	-1	0	-----	-----
<b>y</b>	-----	-----	-----	0	8

4.2 Given the equation:  $2x - 3y = 9$ . Determine the following:

4.2.1 The gradient of the equation. (2)

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4.2.2 The x-intercept of the equation. (2)

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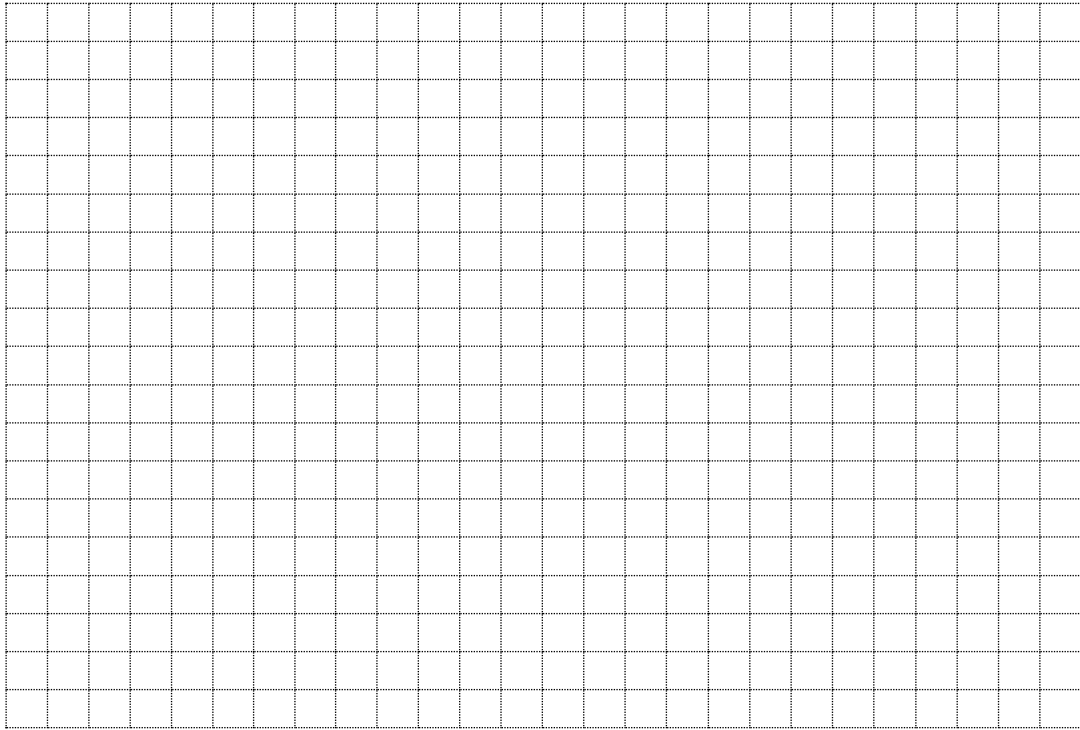
4.2.3 The y-intercept of the equation. (2)

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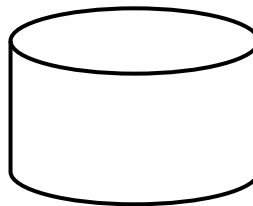
- 4.2.4 Sketch the graph on the given grid. Indicate the x-intercept and y-intercepts on the sketch. (5)



**QUESTION 5**

**[6]**

- 5.1 A cylinder with the height of 2,5cm and radius of 1,8cm is shown below.



- 5.1.1 Calculate it's volume. (3)

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- 5.1.2 Calculate the total surface area. (3)

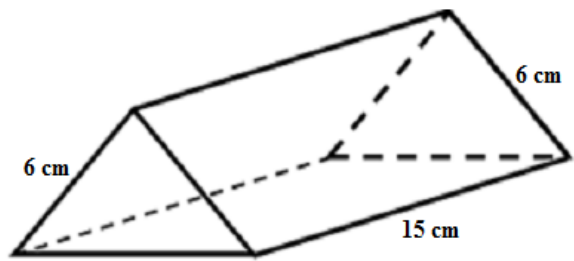
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5.2 Given the diagram below, answer the following questions.



5.2.1 Identify the figure represented above. (1)

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5.2.2 Calculate the volume. (4)

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5.2.3 Calculate the total surface area. (3)

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**QUESTION 6**

**[12]**

A company that makes fruit juice decides to sell its product in 500 ml cuboid containers. Two possibilities are shown. Note  $1 \text{ cm}^3 = 1 \text{ ml}$ .

Figure 1

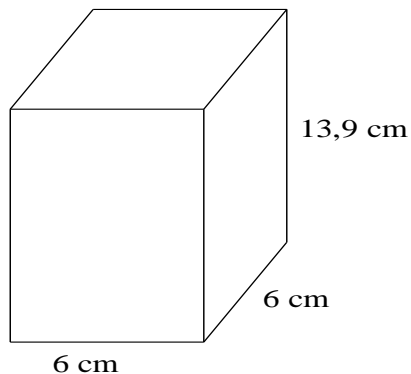
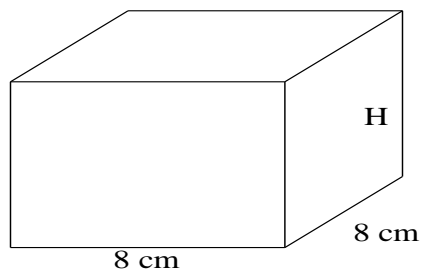


Figure 2



- 6.1 Show that the box depicted in Figure 1 can indeed hold 500ml of juice. (3)

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- 6.2 Calculate the smallest possible height, to 1 decimal place, of the box in Figure 2 so that it can also hold 500 ml of juice. (3)

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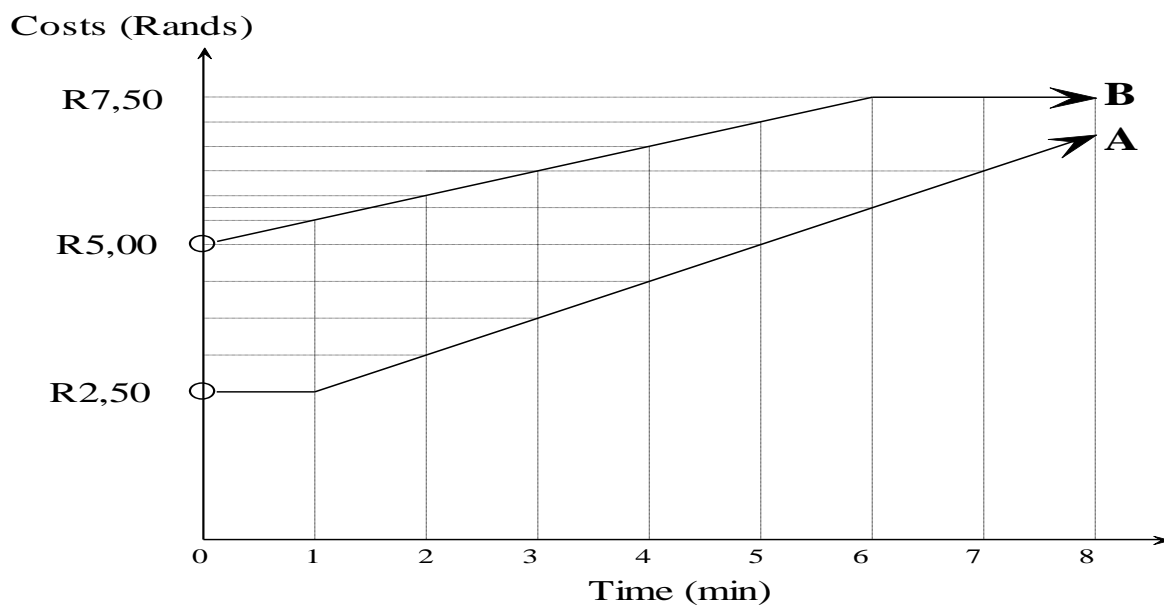
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### QUESTION 7

[6]

The graph below shows the telephone costs that are charged by two different companies.



7.1 Describe what the open circles on the Cost axis means? (1)

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7.2 Describe in your own words how the two different companies charge for their phone calls. (4)

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7.3 What do you think the call charge will be for each company for a nine minute call? (3)

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7.4 Find two equations to show the way in which each company computes their costs. (4)

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7.5 If you make a 15 minute call, show how each company will charge using your equations in 7.4 (2)

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