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GRADE 10

MATHEMATICS

NOVEMBER PAPER 1

2022

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EXAMINER: VERULAM CLUSTER

MODERATOR: VERULAM CLUSTER

MARKS: 75

DATE: 8 NOVEMBER 2022

TIME: 1½ HOURS

INSTRUCTION TO LEARNERS:

- This question paper consists of **FOUR pages** and **SIX questions**. Answer ALL the questions.
- Number answers correctly according to the numbering system used in this question paper.
- You may use an approved non-programmable calculator
- Round off all answers appropriately according to the given context.
- Show ALL calculations clearly.
- Indicate units of measurement, where applicable.
- Write neatly and legibly.

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QUESTION 1:

1.1. Simplify the following:

1.1.1. $2x^2 + 4x$ (1)

1.1.2. $(3p - 2)(9p^2 - 6p + 4)$ (3)

1.1.3. $\frac{2^{x+1} \cdot 2^x \cdot 2^{-2}}{8^{x-1}}$ (3)

1.2. Factorise the following expressions fully:

1.2.1. $3x^2 - 3$ (2)

1.2.2. $20x^2 + 30x - 20$ (3)

1.2.3. $(x - 2y) - ax + 2ay$ (3)

[15]

QUESTION 2:

2.1. Solve for x

2.1.1. $\frac{3}{5}(2x + 7) - 3 = \frac{5x - 2}{3}$ (5)

2.1.2. $x^2 - 10x + 24 = 0$ (3)

2.2. Solve simultaneously for x and y:

$-2x - y = 10 \ and \ 3x - 4y = -4$ (4)

2.3. Timothy a grade 10 learner was challenged by his friend that very few learners can get this maths riddle solved. Help Timothy to solve the problem.

Divide 57 in two parts so that one half of the greater part is 11 more than one fifth of the smaller part. Suppose the greater part is x. (6)

[18]

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QUESTION 3:

3.1. The diagram below shows a pattern of dots:

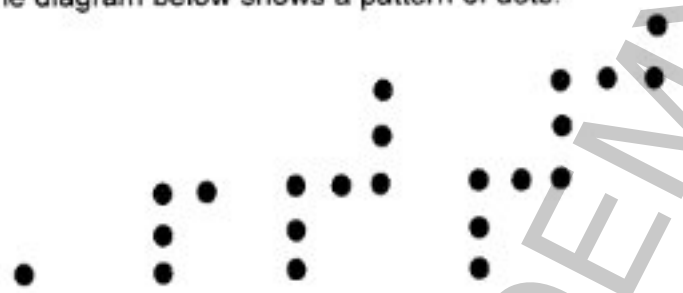


Fig1 Fig2 Fig3 Fig4

3.1.1. Draw the fifth figure. (1)

3.1.2. Determine the general term for this pattern. (2)

3.1.3. How many dots will there be in figure 30? (2)

3.1.4. Which figure will have 136 dots (3)

[8]

QUESTION 4:

4.1. Duffy a single mother needs to invest in her son's future education. What amount did Duffy invest in 2015 to get an amount of R 9000 for the year 2022 school fees. The current interest rate is 5,5% p.a. compound annually. (4)

4.2. Gold is selling at $423,50 per fine ounce. The exchange rate is R 17,93 per dollar. Calculate how much 255 fine ounces of gold will be in rands. (3)

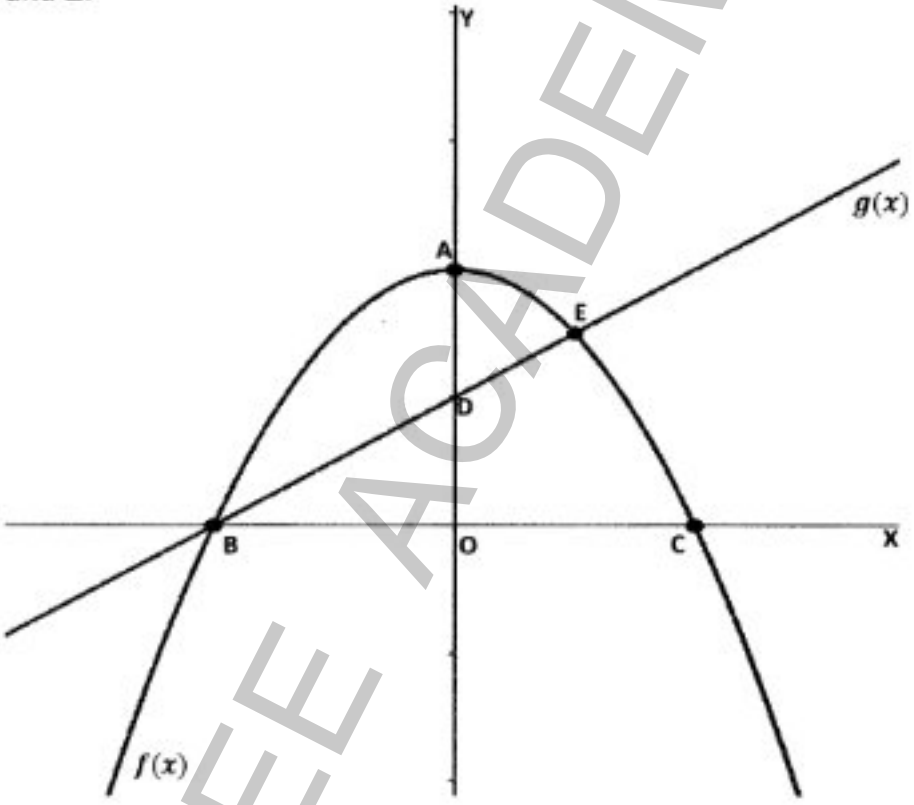
[7]

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QUESTION 5:

5.1. The graphs of $f(x) = -x^2 + 4$ and $g(x) = x + 2$ are sketched below. B and C are the x-intercepts of f(x). A and D are the y-intercepts of f(x) and g(x) respectively. f(x) and g(x) intersect at B and E.



5.1.1. Write down the coordinates of A. (1)

5.1.2. Write down the coordinates of D. (1)

5.1.3. Determine the length of AO. (1)

5.1.4. Calculate the coordinates of B. (3)

5.1.5. Determine the coordinates of E, a point of intersection of f(x) and g(x). (4)

5.1.6. For which values of x will: (2)

$f(x) < g(x)$

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5.2. The function $t(x) = k^x + q$ is described by the following properties:

- $k > 0; k \neq 1$
- X-intercept at (3,0)
- The horizontal asymptote is y = -8

5.2.1. Write down the range of t(x). (1)

5.2.2. Determine the equation of t(x). (3)

5.2.3. Sketch the graph of t(x). show clearly the intercepts with the axes and asymptote. (3)

[19]

QUESTION 6:

6.1. Two hundred teenagers had to answer the following question:
What is your favourite type of music?

- 160 like hip-hop (HH)
- 140 like amapiano (AP)
- 108 like hip-hop and amapiano (HH and AP)

6.1.1. Draw a Venn diagram to illustrate the above information. (4)

6.1.2. Use the Venn Diagram to calculate the probability that a teenager will like the following music:

a) Only amapiano. (2)
b) None of the TWO. (2)

[8]

TOTAL: 75

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