GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2017

GRADE 10

MATHEMATICS

(PAPER 1)

NAME OF LEARNER: _____

GRADE: _____

TIME: 1 hour
MARKS: 50

5 pages

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Time: 1 hour
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INSTRUCTIONS

1. Answer ALL the questions.
2. Clearly show ALL calculations, diagrams, graphs etc. that you have used in determining your answers.
3. Answers only will not necessarily be awarded full marks.
4. An approved scientific calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
5. If necessary, answers should be rounded-off to TWO decimal places, unless stated otherwise.
6. Diagrams are NOT necessarily drawn to scale.
7. Number the answers correctly according to the numbering system used in this question paper.
8. It is in your interest to write legibly and to present your work neatly.

QUESTION 1

Indicate whether each of the following numbers is rational or irrational.

1.1 8 (1)

1.2 $\frac{2}{3}\pi$ (1)

1.3 $\frac{6}{7}+\sqrt[3]{8}$ (1)

[3]

QUESTION 2

Simplify:

2.1 $\left(\frac{5}{12}\right)^{0}$ (1)

2.2 $\frac{-1}{-x^{-1}}$ (1)

2.3 $\frac{9^{x+1}.5^{x+2}}{45^{x+1}}$ (3)

[5]

QUESTION 3

Factorise the following completely:

3.1 $2x^{2}-14x-60$ (3)

3.2 $\frac{1}{8}x^{3}+b^{9}$ (2)

[5]

QUESTION 4

Solve for x:

4.1 $2-3x=6-4x$ (2)

4.2 $\frac{x}{2+x}+\frac{x}{3-x}=\frac{3x-2}{x^2-x-6}$ (5)

4.3 $3^x.9^{2x+1}=81$ (3)

4.4 $-4\leq 3x-1\leq 5$ (3)
[13]

QUESTION 5

Consider the following pattern.


Pattern 1


Pattern 2


Pattern 3

5.1 Write down the formula for the general term of **white circles** in the pattern. (2)

5.2 Write down the formula for the general term of **black circles** in the pattern. (1)

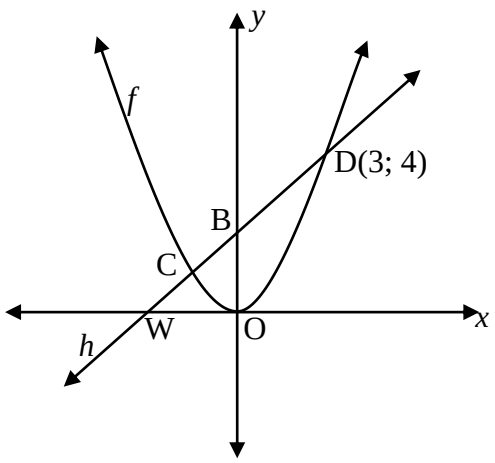
5.3 Use these formulas and calculate

5.3.1 the number of **black circles** in pattern 12. (1)

5.3.2 the pattern number if there are 150 **white circles** in the pattern. (2)
[6]

QUESTION 6

The graphs of $f(x)=ax^2$ and $h(x)=\frac{2}{3}x+2$ are sketched below.



6.1 Determine the equation of the parabola *f*. (2)

6.2 Calculate the coordinates of *C* if the equation of the parabola is $f(x)=\frac{4}{9}x^2$. (5)

6.3 Calculate the length of WO. (2)

6.4 D and T are symmetrical about the line $y=x$. Write down the coordinates of T. (1)

[10]

QUESTION 7

Determine the point of intersection of $y=3.2^x+1$ and $y=\frac{6}{x}+1$ graphically. Clearly show ALL asymptotes as well as *x*-intercepts and *y*-intercepts where applicable. (8)

[8]

TOTAL : 50

END