



Province of the
EASTERN CAPE
EDUCATION



OR TAMBO COASTAL DISTRICT

NATIONAL SENIOR CERTIFICATE

Stanmorephysics.com

GRADE 11

TERM 1

MATHEMATICS INVESTIGATION 2025

Stanmorephysics.com

MARKS: 50

DUE DATE: _____

This question paper consists of 8 pages, including diagram sheets

INSTRUCTIONS

1. You may use colour in the generated graphs.
2. To avoid confusion, you must use 9 different graphs papers according to the questions.
3. **Please make sure that the relevant basic graph (Original graph) must be repeated on each set of graphs.**
4. One labelled system of axes must be used for each set of graphs.
5. All graphs must be clearly labelled with M for the original graph, 1 for Graph 1, 2 for Graph 2, 3 for Graph 3 and 4 for Graph 4.



READ CAREFULLY:

Marks will be given for accuracy, conclusions and presentation and neatness.

QUESTION 1

Parabola – The graph of the form $f(x) = a(x + p)^2 + q$

1.1 Draw the graphs of the equations below according to the Graph Papers indicated:

First Graph Paper

Original graph (M): $y = x^2$

Graph 1: $y = 2x^2$

Graph 2: $y = \frac{1}{2}x^2$

Graph 3: $y = -2x^2$ (4)

Second Graph Paper

Original graph (M): $y = x^2$

Graph 1: $y = x^2 - 4$

Graph 2: $y = x^2 + 2$

Graph 3: $y = 2x^2 - 4$

Graph 4: $y = \frac{1}{2}x^2 + 2$ (4)

Third Graph Paper

Original graph (M): $y = x^2$

Graph 1: $y = (x - 2)^2$

Graph 2: $y = (x + 4)^2$

Graph 3: $y = (x + 2)^2 + 4$

Graph 4: $y = -2(x - 2)^2 - 1$ (4)

1.2 Use the general form of a Parabola: $f(x) = a(x + p)^2 + q$ to make conclusions using the graphs you drew in 1.1. In your conclusion you must mention the effect(s) of a , p and q . (3)

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QUESTION 2

Hyperbola – The graph of $g(x) = \frac{a}{x-p} + q$

2.1 Draw the graphs of the equations below according to the Graph Papers indicated:

First Graph Paper

Original Graph (M): $y = \frac{4}{x}$

Graph 1: $y = \frac{8}{x}$

Graph 2: $y = \frac{2}{x}$

Graph 3: $y = -\frac{4}{x}$ (4)

Second Graph Paper

Original Graph (M): $y = \frac{4}{x}$

Graph 1: $y = \frac{4}{x} + 2$

Graph 2: $y = \frac{4}{x} - 1$

Graph 3: $y = \frac{8}{x} + 2$

Graph 4: $y = -\frac{8}{x} - 1$ (4)

Third Graph Paper

Original Graph (M): $y = \frac{4}{x}$

Graph 1: $y = \frac{4}{x-2}$

Graph 2: $y = \frac{4}{x+2}$

Graph 3: $y = \frac{4}{x-2} - 1$

Graph 4: $y = \frac{4}{x+2} + 2$ (4)

2.2 Use the general form of a Hyperbola: $g(x) = \frac{a}{x-p} + q$ to make conclusions using the diagrams you drew in 2.1. In your conclusion you must mention the effect(s) of a , p and q .

QUESTION 3

Exponential graph – The graph of $h(x) = a \cdot b^{x+p} + q$

3.1 Draw the graphs of the equations below according to the Graph Papers indicated:

First Graph Paper

Original Graph (M): $y = 2^x$

Graph 1: $y = \left(\frac{1}{2}\right)^x$

Graph 2: $y = 3^x$

Graph 3: $y = 3 \cdot 2^x$

Graph 4: $y = -3 \cdot 2^x$ (4)

Second Graph Paper

Original Graph (M): $y = 2^x$

Graph 1: $y = 2^x + 1$

Graph 2: $y = 2^x - 2$

Graph 3: $y = 3 \cdot 2^x + 1$

Graph 4: $y = -3 \cdot 2^x - 1$ (4)

Third Graph Paper

Original Graph (M): $y = 2^x$

Graph 1: $y = 2^{x+1}$

Graph 2: $y = 2^{x-2}$

Graph 3: $y = 2^{x+1} + 1$

Graph 4: $y = -3 \cdot 2^{x-2} - 1$ (4)

3.2 Use the general form of an Exponential Graph $h(x) = a \cdot b^{x+p} + q$ to make conclusions using the diagrams you drew in 3.1. In your conclusion you must mention the effect(s) of a , b , p and q . (4)

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FINAL INSTRUCTIONS

- Graph/ squared paper must be used for all graphs.
- Do not hesitate to consult your teacher for assistance but do not expect the teacher to do the investigation for you, the teacher will only guide you on the expectations of the investigation.

Presentation and Neatness (4)

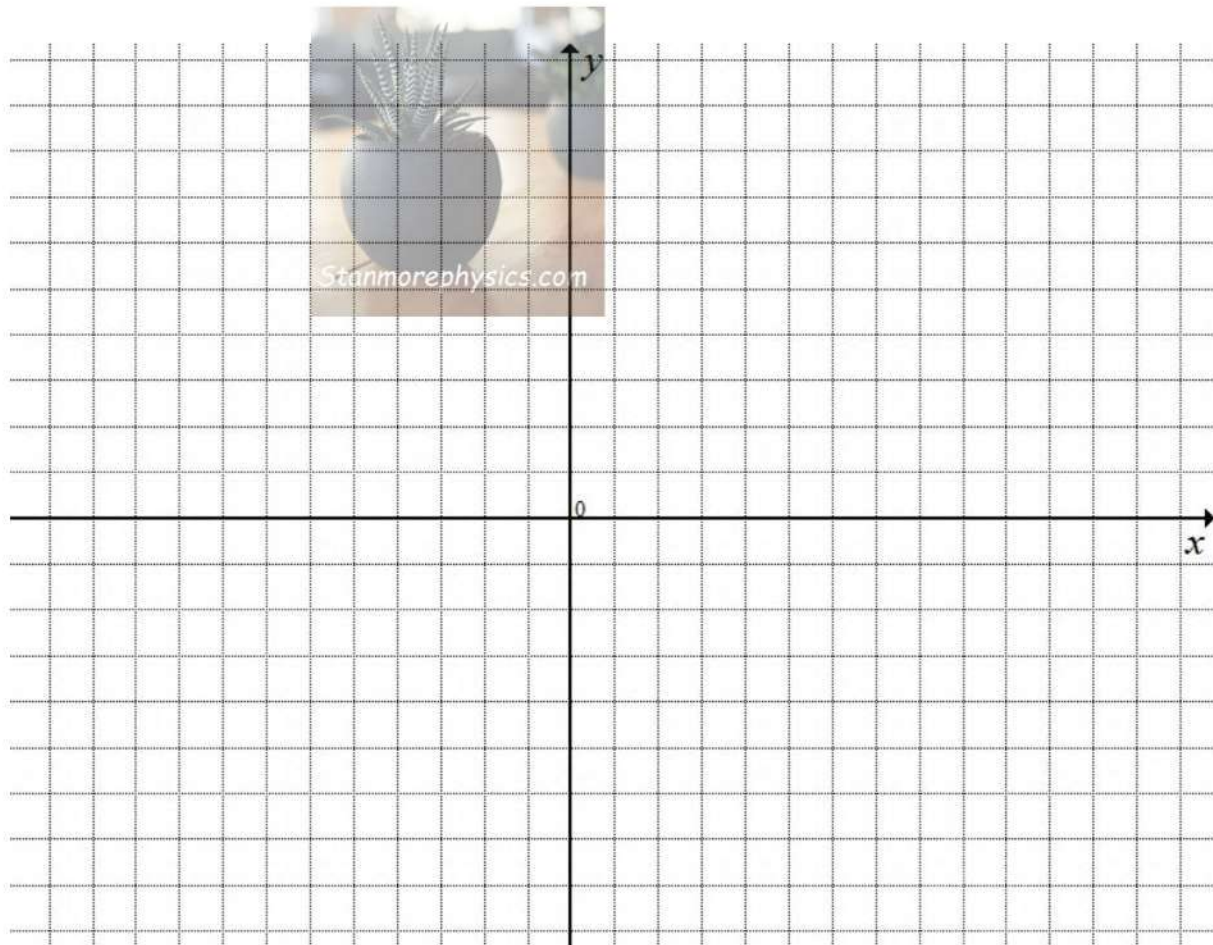
TOTAL MARK: 50

DIAGRAM SHEETS

LEARNER NAME:..... **CLASS :**.....

SCHOOL NAME :.....

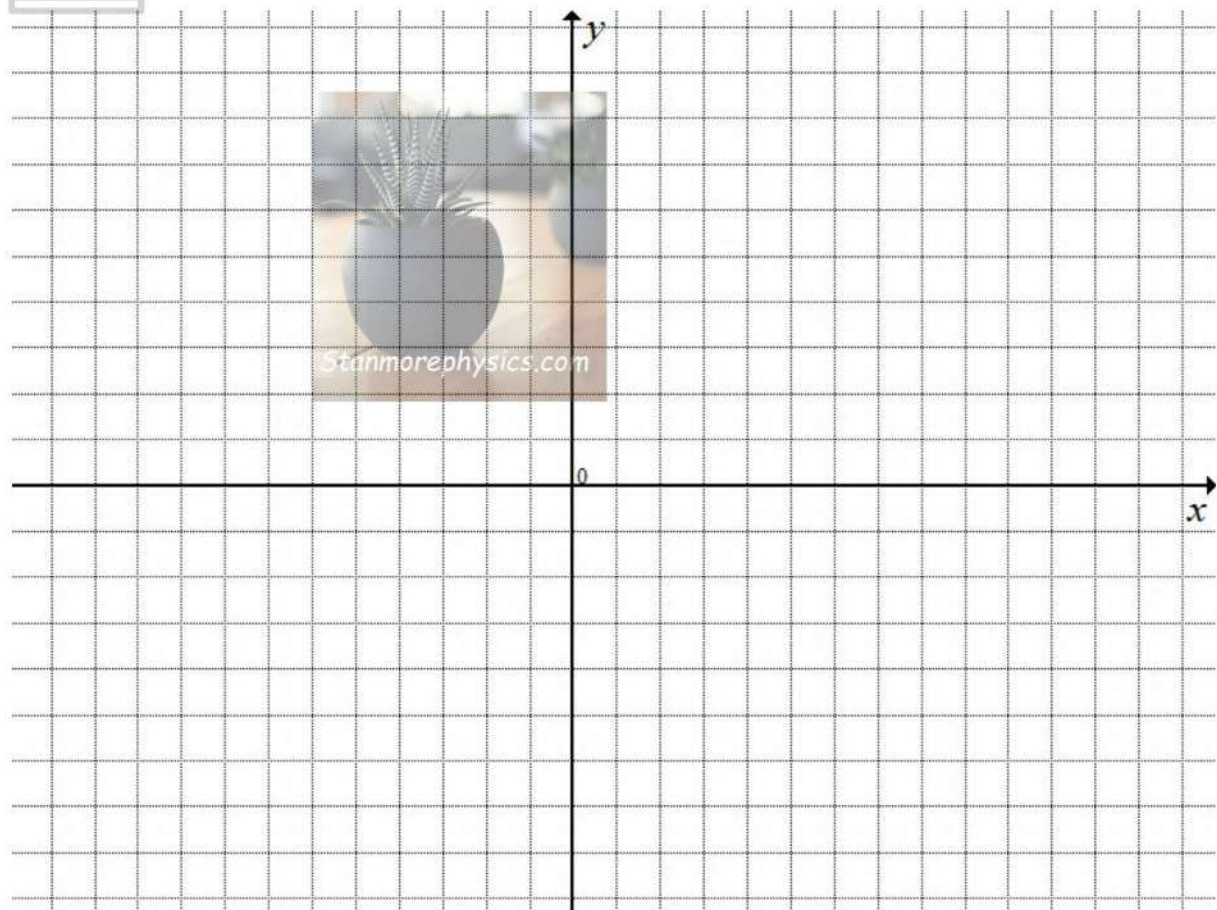
QUESTION 1.1



LEARNER NAME:..... CLASS :.....

SCHOOL NAME :.....

QUESTION 2.2



LEARNER NAME:..... CLASS :.....

SCHOOL NAME :

QUESTION 3.1

