

MATHEMATICS HG PAPER 1

GENERAL

The interpretation of graphs is problematic for most candidates. The graphical method (not the diagram) to solve any inequality should be emphasised. (Q 1.2; 5.3.4)

Most candidates had difficulty communicating their mathematical understanding in words (Q 1.4.2; 7.4)

More attention must be paid to the presentation of an answer. All calculations, graphs, solutions, testing, etc. should be shown on the answer sheet. The stronger candidates especially lost marks unnecessarily as a result of these omissions. (Q3.5) Many candidates did not understand the difference between 'or' and 'and'.

Question 1

1.1.2 The handling of an absolute value inequality is very poor. Pupils should know the definition of an absolute value inequality, e.g.

$$|x - a| > b \Rightarrow x - a < -b \text{ or } x - a > b$$

Many candidates wrote 'and' instead of 'or'; or wrote the answer as $0 > x > 6$.

1.2 If candidates multiplied by $(x - 3)$; they only obtained 1 mark for $x > 6$.

When solving any inequality, they must show the graph from which the solution was read.

The use of $x + y = 10$ was very common. In such a case the candidate lost all the marks.

The term "discriminant" was unfamiliar to many candidates.

1.4.2 This answer has 2 parts

The first part can be done using one of the following three methods:

a) completing the square

b) working out Δ of Δ AND then sketching the graph of $\Delta(a > 0)$ with unreal roots

calculating the minumum value of Δ .

In the second part, the candidate had to explain why $\Delta > 0$.

Question 2

2.1 Badly answered. The only correct answer is: (any number)⁰ = 1 (except 0)

The point $(\frac{1}{2}; 2)$ was substituted into the equation of g . That point only lies on graph f .

2.5 The equation of h , the reflection in the X-axis, was very poorly answered.

The answer: $-y = 4^x$ must not be left as that.

Question 3

Many candidates did not know whether the salient point was on the x-axis or the y-axis. Some of them did not recognise the semi-circle at all.

Badly answered

Poor use of inequality signs (difference between 'and' and 'or')

Solutions here are x- values and should thus be indicated on the x – axis.

Question 4

4.1 Candidates neglected to write = 0 (the remainder).

$f(-2) = 0$; $f(2) = -3$; $f(-2) = 3$ were common incorrect answers.

Question 5

Some candidates saw the denominator $10^a - 10^{a-1} \cdot 2$ as $(10^a - 10^{a-1}) \cdot 2$. They did not understand the concept of one TERM.

Very poorly answered – learners first tried to use summation formulae. When log laws were used the answer was obvious.

5.3.2 Common mistakes: $\frac{27^{-x}}{3} = 9^{-x}$; $3^{x^2 - 1} \cdot 3 = 9^{x^2 - 1}$

5.3.3 Common mistakes: $2\log_x 8 = -2\log_8 x$; $2\log_x 8 = \frac{1}{2\log_8 x}$

Many candidates thought that $\log_8 x = -\frac{1}{3}$ was undefined.

Candidates must write down all the steps (communicate what they are doing) and not forget to take into account that $5 - x > 0$ AND $x > 0$.

Question 6

Many candidates rounded off to an integer and lost marks.
Very few candidates could write this correctly in sigma-notation.

Few candidates were able to set their proofs out logically and clearly with the result that they go lost in their own workings.

Question 7

7.2/7.3 The notation remains a headache.

7.3 Candidates must show all the steps: many wrote only: $y = \dots -2x^2 \cdot \sqrt{x} \dots$
instead of also: $y = \dots -2x^{2\frac{1}{2}} \dots$ and consequently got an incorrect derivative.

Many made the equations of the curves equal to each other and then tried to make $\Delta = 0$. Few candidates realised that the derivative = 1.

Question 8

The rate of increase is $\frac{dA}{dt}$. Candidates must understand this concept.

Very poorly answered. The candidates must use the graph to find the answer (not Δ).

Most interesting answer: "someone threw a stone at him"!

Question 9

Some candidates did not use their rulers carefully to find the maximum point with the gradient of -2 . They then got $x = 100$ and $y = 200$ instead of the correct point. Otherwise this question was well answered.

WISKUNDE HG VRAESTEL 1

ALGEMEEN

1. Die interpretasie van grafieke is vir die meeste kandidate 'n probleem.. Die grafiese metode (nie die diagram nie) vir die oplos van ongelykhede moet beklemtoon word. (Q 1.2; 5.3.4)
2. Baie kandidate sukkel om hulle begrip/insig te verwoord. (Q 1.4.2; 7.4)
3. Meer aandag moet gegee word aan die aanbieding van 'n antwoord. Alle berekeninge, grafieke, oplossings. toetsings, ens. moet op die antwoordskrif getoon word. Dis veral die sterker kandidate wat as gevolg van hierdie leemtes onnodige punte verloor. (Q3.5)
4. Die gebruik van 'en' en 'of' is 'n reuse probleem!!
Kandidate verstaan nie die verskil nie.

Vraag 1

1.1.2 Die hantering van 'n absolute waardeongelykheid is swak. Kandidate moet die definisie van 'n absolute ongelykheid ken, soos:

$$|x - a| > b \Rightarrow x - a < -b \text{ or } x - a > b$$

Baie kandidate skryf 'en' in plaas van 'of', of hulle gee die antwoord as $0 > x > 6$.

1.2 Indien die kandidate vermenigvuldig met $(x - 3)$; verdien hulle slegs 1 punt vir $x > 6$. By die oplossing van enige ongelykheid moet hulle die grafiek toon waarvandaan die oplossing afgelees word.

Die gebruik van $x + y = 10$ was baie algemeen. In so 'n geval het die kandidaat al die punte verloor..

Die term diskriminant is vir baie kandidate onbekend..

1.4.2 Hierdie antwoord het 2 dele.

Die eerste deel kan op 3 verskillende maniere gedoen word:

- a) voltooiing van die kwadraat of
- b) deur Δ van Δ uit te werk EN dan die grafiek van $\Delta(a > 0)$ met nie-reële wortels te skets of

die min.waarde van Δ te bereken.

In die tweede deel moet die kandidaat verduidelik hoekom $\Delta > 0$.

Vraag 2

2.1 Swak beantwoord. Die enigste korrekte antwoord is:
(enige getal)⁰ = 1 (behalwe 0)

Die punt (1/2 ; 2) is in die vergelyking van g ingestel. Hierdie punt lê slegs op grafiek f .

2.5 Die vergelyking van h , die spieëlbeeld in die X-as, is baie swak beantwoord.
Moenie die antwoord: $-y = 4^x$ los nie.

Vraag 3

3.1 Baie kandidate het nie geweet of die omkeerpunt op die x-as of die y-as is nie. Sommige het glad nie die halfsirkel herken nie..

3.2 Swak beantwoord.

3.3 Swak gebruik van ongelykhede (verskil tussen 'en' en 'of')

3.5 Oplossings is x-waardes en daarom moet dit op die x - as aangedui word.

Vraag 4

4.1 Kandidate laat na om = 0 neer te skryf (die RES).

4.2 $f(-2) = 0$; $f(2) = -3$; $f(-2) = 3$; is algemene foute wat voorkom.

Vraag 5

5.1 Sommige kandidate sien die noemer $10^a - 10^{a-1}$ as $(10^a - 10^{a-1}) \cdot 2$. Hulle verstaan nie die konsep van een term nie.

5.2 Baie swak beantwoord – kandidate het eers probeer om somformules te gebruik.

Deur log-wette te gebruik was die antwoord voor die handliggend. 5.3.2 Algemene foute:

$$\frac{27^{-x}}{3} = 9^{-x} ; \quad 3^{x^2-1} = 9^{x^2-1}$$

$$\frac{1}{2 \log_8 x}$$

Baie leerdes het gedink dat $\log_8 x = -\frac{1}{3}$ nie bestaan nie.

5.3.4 Kandidate moet alle stappe neerskryf (kommunikeer wat hulle besig is om te doen) en nie vergeet dat $5 - x > 0$ EN $x > 0$ die beperkings is nie.

Vraag 6

6.3.1 Baie kandidate het hier tot 'n heelgetal afgerond en punte verloor.

Baie min van die kandidate kon die sigma-notasie neerskryf.

6.5 Min kandidate kon hulle stappe logies en duidelik uit een sit. As gevolg hiervan het hulle in hulle eie werk verlore geraak.

Vraag 7

7.2/7.3 Die notasie is nog steeds 'n kopseer.

7.3 Kandidate moet alle stappe aantoon: baie het slegs geskryf: $y = \dots -2x^2 \cdot \sqrt{x} \dots$

in plaas van ook: $y = \dots -2x^{2\frac{1}{2}} \dots$ en derhalwe by die verkeerde afgeleide uitgekom.

Baie het die vergelykings van die 2 krommes aan mekaar gelykgestel en dan probeer om $\Delta = 0$ te stel. Min kandidate het besef dat die afgeleide = 1 is.

Vraag 8

8.1.3 Tempo van verandering is $\frac{dA}{dt}$. Kandidate moet die begrip daarvan verstaan.

8.2.4 Uiters swak beantwoord. Hulle moet die grafiek gebruik om by die antwoord uit te kom (nie Δ !!)

Mees interessante antwoord: "iemand het hom met 'n klip gegooi"!

Vraag 9

Sommige kandidate het nie hulle liniale gebruik om die optimum punt met die gradiënt van -2 te vind nie. Hulle antwoord was dan $x = 100$ en $y = 200$ in plaas van die korrekte punt. Andersins is hierdie vraag goed beantwoord..