basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 10

MATHEMATICS P1

NOVEMBER 2017

MARKS: 100

TIME: 2 hours

This question paper consists of 7 pages.

*X M A T E 1 *

EASTERN CAPE

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1.   This question paper consists of 7 questions.

2.   Answer ALL the questions.

3.   Clearly show ALL calculations, diagrams, graphs, et cetera that you have used to determine the answers.

4.   Answers only will NOT necessarily be awarded full marks.

5.   You must use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.

6.   Round off answers to TWO decimal places, unless stated otherwise.

7.   Diagrams are NOT necessarily drawn to scale.

8.   Number the answers correctly according to the numbering system used in this question paper.

9.   Write neatly and legibly.

QUESTION 1

1.1   Given: $q = \sqrt{b^2 - 4ac}$

      1.1.1   Determine the value of q if $a = 2$, $b = -1$ and $c = -4$.
               Leave your answer in simplest surd form.   (2)

      1.1.2   State whether q is rational or irrational.   (1)

      1.1.3   Between which TWO consecutive integers does q lie?   (1)

1.2   Factorise the following expressions fully:

      1.2.1 $t^2(r - s) - r + s$ (3)

      1.2.2 $\dfrac{x^3 + 1}{x^2 - x + 1}$ (2)

1.3   Simplify the following completely:

      1.3.1 $(2y + 3)(7y^2 - 6y - 8)$ (2)

      1.3.2 $\dfrac{3}{x^2 - 9} + \dfrac{2}{(x - 3)^2}$ (3)

      1.3.3 $\dfrac{3^t - 3^{t-2}}{2.3^t - 3^t}$ (3)

                                                              [17]

QUESTION 2

2.1   Given: $4 - 2x < 16$ where $x \in R$

      2.1.1   Solve the inequality.   (2)

      2.1.2   Hence, represent your answer to QUESTION 2.1.1 on a number line.   (1)

2.2   Solve simultaneously for x and y:

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

2.3   Solve for x:

      2.3.1 $\dfrac{x(x - 5)}{6} - 1 = 0$ (3)

      2.3.2 $c = \sqrt{a + 2x}$ (2)

2.4   Tabelo is currently four times as old as his daughter, Linda. Six years from now,
      Tabelo will be three times as old as Linda.

      Calculate Linda's age currently.   (4)

                                                    [16]

QUESTION 3

3.1   Consider the linear sequence: 5 ; 8 ; 11 ; b ; 17 ; …

      3.1.1   Write down the value of b. (2)

      3.1.2   Determine the nth term of the sequence. (2)

      3.1.3   Calculate the value of the 15th term of the sequence. (2)

      3.1.4   Which term in the sequence is equal to 83? (2)

3.2   Consider the number pattern below created by using the numbers of the sequence 2 ; 6 ; 10 ; 14 ; 18 ; …

$$2$$
$$6 \qquad 10$$
$$14 \qquad 18 \qquad 22$$
$$26 \qquad 30 \qquad 34 \qquad 38$$
$$42 \qquad … \qquad … \qquad … \qquad …$$

      3.2.1   Calculate the sum of the numbers in the 8th row. (3)

      3.2.2   Determine the mean of the numbers in the 20th row. (2)

[13]

QUESTION 4

4.1   Seven years ago, Mrs Grey decided to invest R18 000 in a bank account that paid simple interest at 4,5% p.a.

      4.1.1   Calculate how much interest Mrs Grey has earned over the 7 years. (2)

      4.1.2   Mrs Grey wants to buy a television set that costs R27 660,00 now. If the average rate of inflation over the last 5 years was 6,7% p.a., calculate the cost of the television set 5 years ago. (3)

      4.1.3   At what rate of simple interest should Mrs Grey have invested her money 7 years ago if she intends buying the television set now using only her original investment of R18 000 and the interest earned over the last 7 years? (3)

4.2   On a certain day the exchange rate between the US dollar and South African rand is $1 = R12,91. At the same time the exchange rate between the British pound and the South African rand is £1 = R16,52.

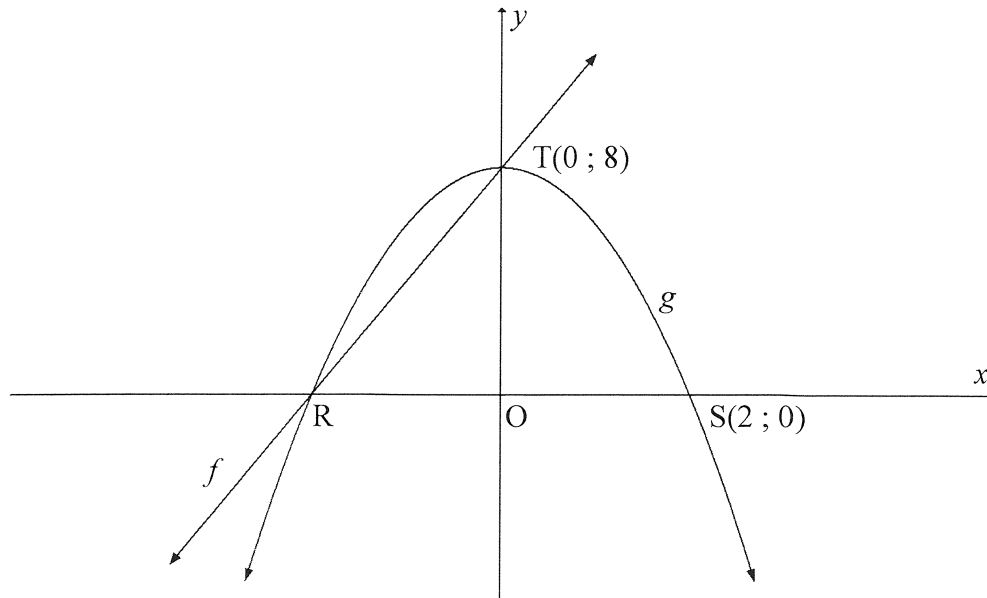   Calculate the exchange rate between the British pound and US dollar on that day. (2)

[10]

EASTERN CAPE

QUESTION 5

The diagram shows the graphs of $g(x) = ax^2 + q$ and $f(x) = mx + c$.
R and S(2 ; 0) are the x-intercepts of g and T(0 ; 8) is the y-intercept of g.
Graph f passes through R and T.

5.1   Write down the range of g.   (1)

5.2   Write down the x-coordinate of R.   (1)

5.3   Calculate the values of a and q.   (3)

5.4   Determine the equation of f.   (3)

5.5   Use the graphs to determine the value(s) of x for which:

        5.5.1 $f(x) = g(x)$ (2)

        5.5.2 $x \cdot g(x) \leq 0$ (3)

5.6   The graph h is obtained when g is reflected along the line $y = 0$.
        Write down the equation of h in the form $h(x) = px^2 + k$.   (2)

[15]

QUESTION 6

6.1 The function $p(x) = k^x + q$ is described by the following properties:

- $k > 0 ; k \neq 1$
- x-intercept at $(2 ; 0)$
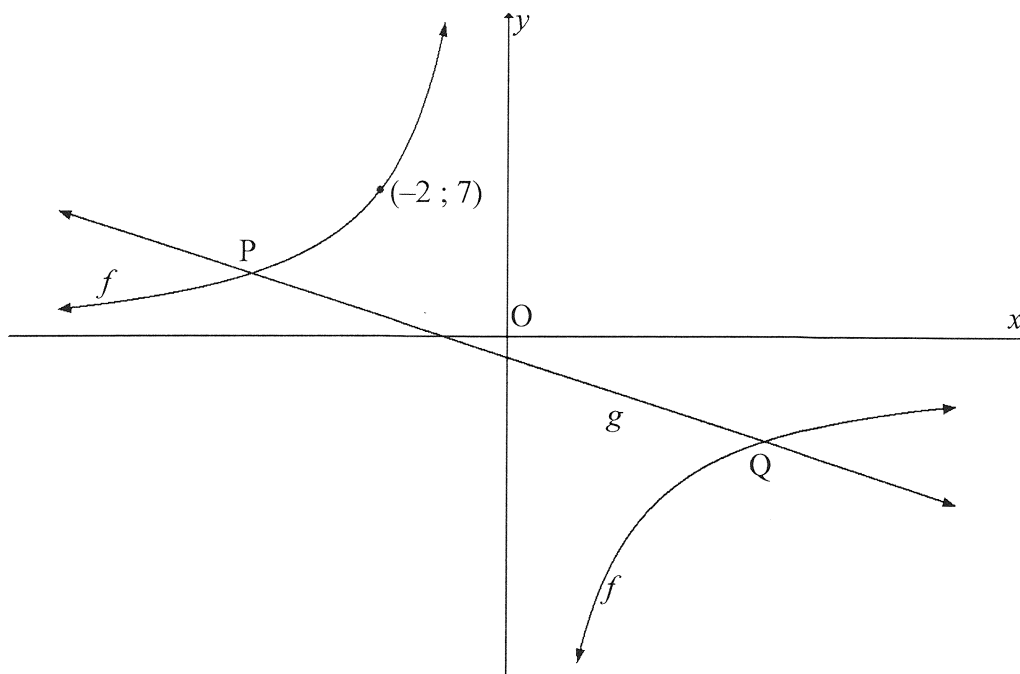- The horizontal asymptote is $y = -9$

6.1.1 Write down the range of p. (1)

6.1.2 Determine the equation of p. (3)

6.1.3 Sketch the graph of p. Show clearly the intercepts with the axes and the asymptote. (3)

6.2 The sketch below shows the graphs of $f(x) = \dfrac{k}{x} + w$ and $g(x) = -x - 1$.

The graph g is an axis of symmetry of f. The graphs f and g intersect at P and Q.

6.2.1 Write down the value of w. (1)

6.2.2 The point $(-2 ; 7)$ lies on f. Calculate the value of k. (2)

6.2.3 Calculate the x-coordinates of P and Q. (4)

6.2.4 Write down the values of x for which $\dfrac{-16}{x} > -x$. (2)

[16]

QUESTION 7

7.1   Two events, A and B, are complementary and make up the entire sample space.
        Also, $P(A') = 0,35$.

        7.1.1   Complete the statement: $P(A) + P(B) = \ldots$ (1)

        7.1.2   Write down the value of $P(A \text{ and } B)$.   (1)

        7.1.3   Write down the value of $P(B)$.   (1)

7.2   A survey was conducted among 150 learners in Grade 10 at a certain school to establish
        how many of them owned the following devices: smartphone (S) or tablet (T).

        The results were as follows:

        •   8 learners did not own either a smartphone or a tablet.
        •   20 learners owned both a smartphone and a tablet.
        •   48 learners owned a tablet.
        • x learners owned a smartphone.

        7.2.1   Represent the information above in a Venn diagram.   (4)

        7.2.2   How many learners owned only a smartphone?   (3)

        7.2.3   Calculate the probability that a learner selected at random from this group:

                  (a)   Owned only a smartphone   (1)

                  (b)   Owned at most one type of device   (2)
                                                                                                  [13]

                                                             TOTAL: **100**

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NATIONAL
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NASIONALE
SENIOR SERTIFIKAAT

GRADE/*GRAAD* 10

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2017

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 100

These marking guidelines consist of 12 pages.
Hierdie nasienriglyne bestaan uit 12 bladsye.

2017-11-05

NOTE:
- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

LET WEL:
- *As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.*
- *Dit is onaanvaarbaar dat waardes/antwoorde veronderstel word om 'n probleem op te los.*

QUESTION/*VRAAG* 1

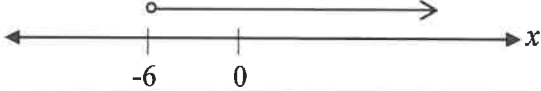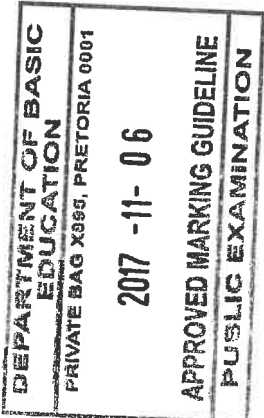| 1.1.1	$q = \sqrt{b^2 - 4ac}$ $q = \sqrt{(-1)^2 - 4(2 \times -4)}$ $q = \sqrt{33}$	✓correct subst./*korrek verv.* ✓answ/*antw* (2)
1.1.2	Irrational/*Irrasionaal*	✓answ/*antw* (1)
1.1.3	5 and/*en* 6	✓answ/*antw* (1)
1.2.1	$t^2(r-s) - r + s$ $= t^2(r-s) - (r-s)$ $= (r-s)(t^2 - 1)$ $= (r-s)(t-1)(t+1)$	✓common factor/*gemene faktor* ✓factors/*faktore* ✓difference of two squares/ *verskil van twee kwadrate* (3)
1.2.2	$\dfrac{x^3 + 1}{x^2 - x + 1}$ $= \dfrac{(x+1)(x^2 - x + 1)}{x^2 - x + 1}$ $= x+1$	factors of numerator: ✓$(x+1)$ ✓$(x^2 - x + 1)$ (2)
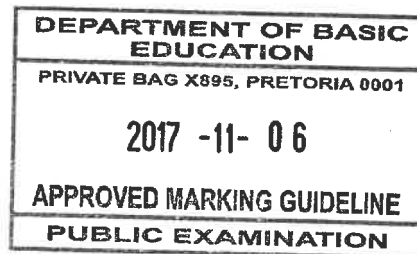
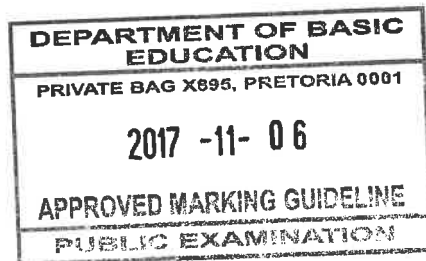| 1.3.1	$(2y+3)(7y^2-6y-8)$ $= 14y^3 - 12y^2 - 16y + 21y^2 - 18y - 24$ $= 14y^3 + 9y^2 - 34y - 24$	✓multiplying brackets/*vermenigvuldig hakkies* ✓answ/*antw* (2)
1.3.2	$\dfrac{3}{x^2-9} + \dfrac{2}{(x-3)^2}$ $= \dfrac{3}{(x-3)(x+3)} + \dfrac{2}{(x-3)^2}$ $= \dfrac{3(x-3)+2(x+3)}{(x-3)^2(x+3)}$ $= \dfrac{3x-9+2x+6}{(x-3)^2(x+3)}$ $= \dfrac{5x-3}{(x-3)^2(x+3)}$	✓LCD/*KGN* ✓$3(x-3)+2(x+3)$ ✓answ/*antw* (3)
1.3.3	$\dfrac{3^t - 3^{t-2}}{2.3^t - 3^t}$ $= \dfrac{3^t(1-3^{-2})}{3^t(2-1)}$ $= \dfrac{1-\dfrac{1}{9}}{1}$ $= \dfrac{8}{9}$	✓factors/*faktore* ✓simpl./*vereenv* ✓answ/*antw* (3)
		[17]

QUESTION/*VRAAG* 2

2.1.1	$4 - 2x < 16$ $4 - 2x < 16$ $-2x < 12$ **OR / *OF*** $-12 < 2x$ $x > -6$ $-6 < x$	✓ simpl./*vereenv* ✓ answ/*antw* (2)
2.1.2		✓ answ/*antw* (1)
2.2	$3x - 4y = -4 \ldots\ldots\ldots\ldots(1)$ $-2x - y = 10 \ldots\ldots\ldots\ldots(2)$ $3x - 4y = -4 \ldots\ldots\ldots\ldots\ldots(1)$ $(2) \times -4 : 8x + 4y = -40 \ldots\ldots\ldots\ldots(3)$ $(1) + (3) : 11x = -44$ $x = -4$ substitute $x = -4$ into (2) $-2(-4) - y = 10$ $y = -2$ **OR/*OF*** $3x - 4y = -4 \ldots\ldots\ldots\ldots(1)$ $-2x - y = 10 \ldots\ldots\ldots\ldots(2)$ $(1) \times 2 : 6x - 8y = -8.,\ldots\ldots\ldots\ldots(3)$ $(2) \times 3 : -6x - 3y = 30 \ldots\ldots\ldots\ldots(4)$ $(3) + (4) : -11y = 22$ $y = -2$ substitute $y = -4$ into (2) $-2x - (-2) = 10$ $2x = -8$ $x = -4$ **OR/*OF*** From(2): $y = -2x - 10 \ldots\ldots\ldots\ldots(3)$ subst.(3) into (1) : $3x - 4(-2x - 10) = -4$ $3x + 8x + 40 = -4$ $11x = -44$ $x = -4$ subst. $x = -4$ into (3) : $y = -2(-4) - 10$ $y = -2$	✓ multipl/*maal* (2) by/*met* 4 ✓ adding/*tel op* (1) & (3) ✓ x-value/*waarde* ✓ y-value/*waarde* (4) **OR/*OF*** ✓ multipl/*maal* (1) by/*met* 2 and multipl/*maal* (2) by/*met* 3 ✓ adding/*tel op* (3) & (4) ✓ y-value/*waarde* ✓ x-value/*waarde* (4) **OR/*OF*** ✓ equation/*verg* (3) ✓ subst./*verv.* ✓ x-value/*waarde* ✓ y-value/*waarde* (4)

2.3.1	$\dfrac{x(x-5)}{6}-1=0$	
	$x^2-5x-6=0$	✓ stand. form/-*vorm*
	$(x-6)(x+1)=0$	✓ factors/*faktore*
	$x=6$ or $x=-1$	✓ answ/*antw*
		(3)
	OR/*OF*	**OR/*OF***
	$\dfrac{x(x-5)}{6}-1=0$	
	$\dfrac{x^2-5x-6}{6}=0$	✓ stand. form/-*vorm*
	$\dfrac{(x-6)(x+1)}{6}=0$	✓ factors/*faktore*
	$x-6=0$ or $x+1=0$	✓ answ/*antw*
	$x=6$ or $x=-1$	(3)
2.3.2	$c=\sqrt{a+2x}$	
	$c^2=a+2x$	✓ squaring both sides/*kwadreer beide kante*
	$2x=c^2-a$	
	$x=\dfrac{c^2-a}{2}$	✓ answ/*antw*
		(2)
2.4	Let Linda's age now be *x*/*Laat Linda se ouderdom nou x wees*	
	Therefore Tabelo's age is 4*x*/*Dus is Tabelo se ouderdom 4x*	✓ $4x$
	6 years/*jaar* later: Linda's age will be:/	
	Linda se ouderdom sal wees: x + 6	✓ $x+6$
	Tabelo's age will be:/	
	Tabelo se ouderdom sal wees:4x + 6	
	$4x+6=3(x+6)$	
	$4x-3x=18-6$	✓ equating/*verg.*
	$x=12$	
	Linda's age/*Linda se ouderdom* is 12 years/*jaar*	✓ answ/*antw*
		(4)
		[16]

QUESTION/*VRAAG* 3

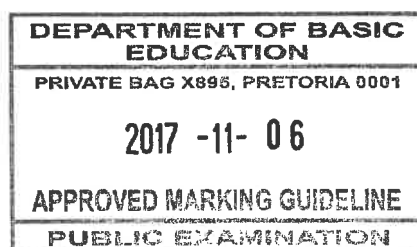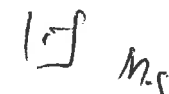|		
3.1.1	constant difference = 3 $b = 14$	✓ constant diff/*konstante verskil* = 3 ✓ answ/*antw* (2)
3.1.2	The sequence is linear/*Hierdie ry is lineêr*: $T_n = pn + q$. $T_n = 3n + q$ $T_n = 3n + 2$	✓3n ✓2 (2)
3.1.3	$T_n = 3n + 2$ $T_{15} = 3(15) + 2$ $T_{15} = 47$	✓ subst./*verv.* ✓ answ/*antw* (2)
3.1.4	$T_n = 3n + 2$ $83 = 3n + 2$ $3n = 81$ $n = 27$	✓ $T_n = 83$ ✓ answ/*antw* (2)
3.2.1	Sum of the terms in rows/*Som van terme in ry*: 2 ; 16 ; 54 ; 128 ;....... Row/*Ry* 1: 2 x 1 = 2 Row/*Ry* 2 : 2 x 8 = 16 Row/*Ry* 3 : 2 x 27 = 54 Row/*Ry* 4 : 2 x 64 = 128 . . Row/*Ry* $n : 2n^3$ Row/*Ry* 8 = $2(8)^3 = 1024$ **OR/*OF*** Pattern for the first terms in rows/*Patroon van die eerste terme in rye*: 2; 6; 14 ; 26 ; ... 2 ; 4(1)+2 ; 4(1)+4(2)+2 ; 4(1)+4(2)+4(3)+2 ; .... $T_8 = 4(1 + 2 + 3 + 4 + 5 + 6 + 7) + 2$ $\quad = 114$ Sum of the terms in row 8/*Som van terme in ry 8* $= 114 + 118 + 122 + 136 + 130 + 134 + 138 + 142$ $= 1024$	✓gen./*alg.* term ✓ subst./*verv.* ✓ answ/*antw* (3) **OR/*OF*** ✓ $T_8 = 114$ ✓sum of terms in row/*som van terme in ry* 8 ✓ answ/*antw* (3)

3.2.2	Mean in row/*Gemiddeld in ry* $20 = \dfrac{2(20)^3}{20} = 800$	✓ subst./*verv.* ✓ answ/*antw* (2)
	OR/*OF*	**OR/*OF***
	First term of row/*Eerste term in ry* 20: $T_{20} = 4(1 + 2 + 3 + 4 + ... + 19) + 2$ $= 762$ Sum of terms in row/*Som van terme in ry* 20 $= 762 + 766 + 770 + ... + 838.$ $= 16000$ $\therefore$ Mean/*Gemiddeld* $= \dfrac{16000}{20} = 800$	✓ 16 000 ✓ answ/*antw* (2)
		[13]

QUESTION/*VRAAG* 4

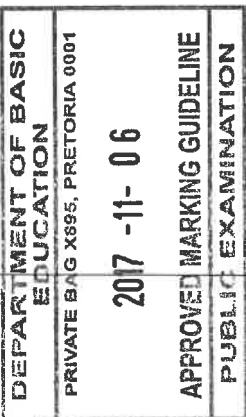| 4.1.1	$A = P(1 + i.n)$ $= 18000(1 + 0,045 \times 7)$ $= R23670$ Interest/*Rente* $= 23670 - 18000$ $= R5670$ **OR/*OF*** $SI = \dfrac{Prt}{100}$ $= \dfrac{18000 \times 4,5 \times 7}{100}$ $= R5670,00$	✓ R23 670 ✓R5 670 (2) **OR/*OF*** ✓ subst./*verv.* ✓ answ/*antw* (2)
4.1.2	$A = P(1 + i)^n$ $R27660 = P(1 + 0,067)^5$ $P = \dfrac{27660}{(1 + 0,067)^5}$ $P = R20000$	✓ correct subst./*korrek verv.* in correct formula/ *korrekte formule* ✓ making P the subject/*maak P onderwerp van foemule* ✓ answ/*antw* (3)
4.1.3	$A = P(1 + i.n)$ $27660 = 18000(1 + i \times 7)$ $7i = \dfrac{27660}{18000} - 1$ $i = \dfrac{\frac{27660}{18000} - 1}{7}$ $i = 0,07666....$ Simple interest rate should have been/ *Eenvoudige rente moes wees* 7,67%	✓ correct subst./*korrek verv.* in correct formula/in *korrekte formule* ✓ making *i* the subject/*maak i onderwerp van formule* ✓ answ/*antw* as % (3)
4.2	$\dfrac{Pound/\textit{Pond}}{Dollar} = \dfrac{R16,52}{R12,91}$ $\therefore £1 \approx \$1,28$ **OR/*OF*** $\dfrac{Dollar}{Pound/\textit{Pond}} = \dfrac{R12,91}{R16,52}$ $\therefore$	✓proportion/*verhouding* ✓ £1 ≈ \$1,28 (2) **OR/*OF*** ✓proportion/*verhouding* ✓\$1 ≈ £0,78 (2)

[10]
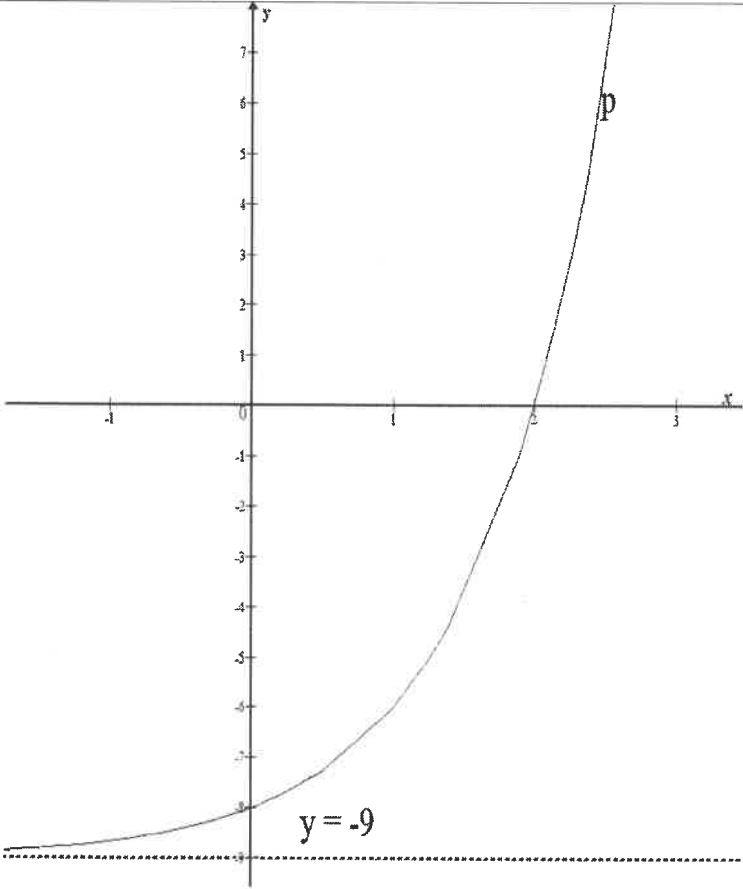
QUESTION/*VRAAG* 5

5.1	Range of/*Waardeversameling van* $g : y \leq 8$ **OR/*OF*** $y \in (-\infty ; 8]$	✓ answ/*antw* (1) **OR/*OF*** ✓ answ/*antw* (1)
5.2	The x-coordinate of R is -2	✓ answ/*antw* (1)
5.3	$g(x) = ax^2 + 8 \Rightarrow q = 8$ $g(2) = a(2)^2 + 8 = 0$ $\Rightarrow a = -2$ **OR/*OF*** $g(x) = ax^2 + 8 \Rightarrow q = 8$ $g(-2) = a(-2)^2 + 8 = 0$ $\Rightarrow a = -2$	✓ $q = 8$ ✓ subst./*verv.* $(2 ; 0)$ ✓ $a = -2$ (3) **OR/*OF*** ✓ $q = 8$ ✓ subst./*verv.* $(-2 ; 0)$ ✓ $a = -2$ (3)
5.4	$f(x) = mx + c \Rightarrow c = 8$ $f(-2) = -2m + 8 = 0$ $\Rightarrow m = 4$ $f(x) = 4x + 8$	✓ $c = 8$ ✓ $m = 4$ ✓ equation / *vergelyking* (3)
5.5.1	$x = -2$ or $x = 0$	✓ $x = -2$ ✓ $x = 0$ (2)
5.5.2	$x . g(x) \leq 0$ $-2 \leq x \leq 0$ or $x \geq 2$ **OR/*OF*** $x \in [-2 ; 0]$ or $x \in [2 ; \infty)$	✓✓ $-2 \leq x \leq 0$ ✓ $x \geq 2$ (3) **OR/*OF*** ✓✓ $[-2 ; 0]$ ✓ $[2 ; \infty)$ (3)
5.6	$h(x) = -(-2x^2 + 8)$ $h(x) = 2x^2 - 8$	✓ $h(x) = -(g(x))$ ✓ $2x^2 - 8$ (2)
		[15]

QUESTION/*VRAAG* 6

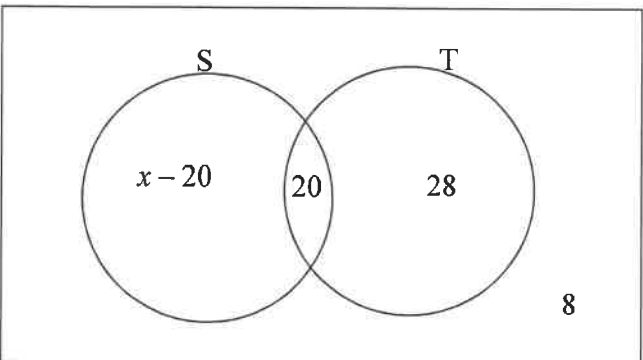| 6.1.1	The range/*Waardeversameling* $y > -9$ **OR/OF** $y \in (-9; \infty)$	✓ answ/*antw* (1) **OR/OF** ✓ answ/*antw* (1)
6.1.2	$p(x) = k^x + q$ $p(x) = k^x - 9$ $0 = k^2 - 9$ $k^2 = 9$ $k = \pm 3$ $k = 3$ since/omdat $k > 0$ $p(x) = 3^x - 9$	✓ $q = -9$ ✓ subst/*verv.* $(2; 0)$ ✓ $k = 3$ (3)
6.1.3	 $y = -9$	✓ asymptote/*asimptoot* ✓ intercepts/*afsnitte* ✓ shape: increasing /*vorm: stygend* (3)
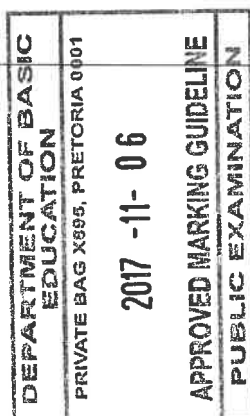
6.2.1	$w = -1$	✓ answ/*antw* (1)
6.2.2	$f(x) = \dfrac{k}{x} - 1$ $7 = \dfrac{k}{-2} - 1$ $k = -16$	✓ subst./*verv.* $(-2 \ ; 7)$ ✓ answ/*antw* (2)
6.2.3	$f(x) = g(x)$ $\dfrac{-16}{x} - 1 = -x - 1$ $x^2 - 16 = 0$ $(x-4)(x+4) = 0$ $x_Q = 4 \ $ or $ \ x_P = -4$	✓ equating/*verg.* ✓ simpl./*vereenv* ✓ $x = -4$ at/*by* P ✓ $x = 4$ at Q (4)
6.2.4	$-4 < x < 0$ or $x > 4$ **OR/*OF*** $x \in (-4 \ ; 0)$ or $x \in (4 \ ; \infty)$	✓ $-4 < x < 0$ ✓ $x > 4$ **OR/*OF*** ✓ $(-4 \ ; 0)$ ✓ $(4 \ ; \infty)$ (2)
		[16]

QUESTION/*VRAAG* 7

7.1.1	$P(A) + P(B) = P(A \text{ or } B)$ **OR/*OF*** $P(A) + P(B) = 1$ **OR/*OF*** $P(A) + P(B) = P(S)$	✓ answ/*antw* **OR /*OF*** (1) ✓ answ/*antw* **OR/*OF*** (1) ✓ answ/*antw* (1)
7.1.2	$P(A \text{ and } B) = 0$	✓ answ/*antw* (1)
7.1.3	$P(B) = P(A')$ $\quad = 0{,}35$	✓ answ/*antw* (1)
7.2.1		✓20 (in the intersection/*in die snyding*) ✓28 (in T only/*slegs in T*) ✓ $x - 20$ (in S only/*slegs in S*) ✓8 (outside/*buite of* S or/*of* T) (4)
7.2.2	$x - 20 + 20 + 28 + 8 = 150$ $\qquad\qquad\qquad x = 114$ Smartphone only/*Slegs slimfoon* $= 114 - 20$ $\qquad\qquad\qquad\qquad\quad = 94$	✓equation/*verg.* ✓ value/*waarde* of/*van* x ✓ answ/*antw* (3)
7.2.3 (a)	$P(\text{S only}/\textit{slegs}) = \dfrac{94}{150} = 0{,}63$	✓ answ/*antw* (1)
7.2.3 (b)	$P(\text{S or}/\textit{of} \text{ T or neither}/\textit{of geeneen}) = \dfrac{94}{150} + \dfrac{28}{150} + \dfrac{8}{150}$ $\qquad\qquad\qquad\qquad\qquad = \dfrac{130}{150}$ $\qquad\qquad\qquad\qquad\qquad = \dfrac{13}{15}$ $\qquad\qquad\qquad\qquad\qquad = 0{,}87$ **OR/*OF*** $P(\text{S or}/\textit{of} \text{ T or neither}/\textit{of geeneen}) = 1 - \dfrac{20}{150}$ $\qquad\qquad\qquad\qquad\qquad = \dfrac{13}{15}$ $\qquad\qquad\qquad\qquad\qquad = 0{,}87$	✓addition/*optel* ✓ answ/*antw* (2) **OR/*OF*** ✓complementary rule/*komplementêre reël* ✓ answ/*antw* (2)
		[13]

TOTAL/*TOTAAL*: 100

NOTE:
- If a candidate answers a question TWICE, only mark the FIRST attempt.
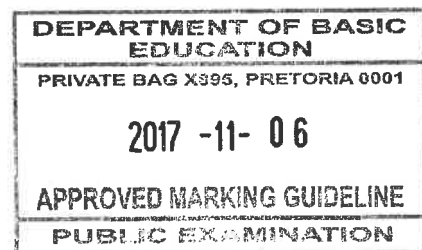- Consistent accuracy applies in ALL aspects of the marking memorandum.

LET WEL:
- *Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die memorandum van toepassing.*

ONCE A CANDIDATE HAS REACHED 2 ERRORS RELATED TO MARKS: STOP MARKING.

QUESTION/*VRAAG 1*

1.1.1	Answer only: 2/2 marks
1.1.2	CA from 1.1.1
	If the candidate states irrational but not consistent with 1.1.1, then 0 marks.
1.1.3	CA from 1.1.1
1.2.1	$t^2(r-s)-r+s$ $=t^2(r-s)-(r+s)$: BD 0/3marks $t^2(r-s)-r+s$ $=t^2(r-s)+(r-s)$: CA on removing common factor 1/3marks $=(r-s)(t^2+1)$ $=$
1.3.2	CA on numerator according to LCD
1.3.3	No penalty for using calculator to simplify exponents

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QUESTION/*VRAAG* 2

2.1.1	$4 - 2x < 16$ $\qquad 2x < 12 \qquad$: BD 0/2 marks $\qquad x < 6$
2.1.2	CA from 2.1.1
2.3.1	$\dfrac{x(x-5)}{6} - 1 = 0$ $\dfrac{x^2 - 5x - 6}{6} = 0$ $\dfrac{(x-6)(x+1)}{6} = 0$ $\dfrac{x-6}{6} = 0 \quad$ or $\quad \dfrac{x+1}{6} = 0$ $x = 6 \quad$ or $\quad x = -1$ Although the answer is correct, there is a breakdown in the working. Award 2/3 marks Similarly, if the working is shown as above and the answers are $x = 1$ or $x = -\dfrac{1}{6}$, we cannot award a CA mark for the answers. Award 2/3 marks.
2.4	• Solving by Trial and error with working shown: 4/4 marks • Answer only (no working shown) : 1/4 marks • $x + 6 = 3(4x + 6)$ shows a misunderstanding of the situation. Further, this results in $\qquad x = -\dfrac{12}{11}$. Award 2/4 marks

QUESTION/*VRAAG* 3

3.1.1	Answer only: 2/2 marks
3.1.2	CA only if constant difference from 3.1.1 is used.
3.1.3	CA only if 3.1.2 is linear
3.1.4	• CA only if 3.1.2 is linear • CA on answer only if positive integer solution. If negative or fraction solution, then no CA mark.
3.2.1	Answer only: 1/3 marks Accept the use of quadratic number pattern theory in obtaining first term of 8th row.
3.2.2	• CA from 3.2.1 applies for the formula in the numerator • No CA for answer if any random number is divided by 20.

QUESTION/*VRAAG 4*

4.1.2	No marks if incorrect formula is used
4.1.3	No penalty for incorrect rounding No marks if incorrect formula is used
4.2	Penalise 1 mark for incorrect rounding. Answer only £1 ≈ $1,28 or $1 ≈ £0,78 : 2/2 marks

QUESTION/*VRAAG 5*

5.1	Accept $(-\infty; 8]$
5.2	Accept R(–2 ; 0). No marks for any other coordinates.
5.4	CA from 5.2 applies in calculating the value of *m*.
5.5.1	• CA from 5.2 • Accept as correct (–2 ; 0) and (0 ; 8) • Solution by calculation is acceptable
5.5.2	• CA from 5.2 • Accept $[-2; 0]$ or $[2; \infty)$ • No part marks awarded for $-2 \le x \le 0$. Either 2 marks for correct answer or 0.
5.6	• Answer only 2/2marks • Both *p* and *k* must be correct to award 2 marks. No part marks to be allocated. • CA from 5.3 only if $p > 0$ and $k < 0$.

QUESTION/*VRAAG 6*

6.1.1	Accept $(-9; \infty)$
6.1.3	• If candidates draw a straight line or a parabola through the correct intercepts, award 1/3 marks. • If only the intercepts are shown and no graph drawn, award 0/3.
6.2.2	CA on *k* only if $k < 0$.
6.2.3	• CA from 6.2.2 • CA on values for *x* only if one positive answer and one negative answer • If P and Q not specified, max 3/4 marks. • Answer only 1/4 marks
6.2.4	• CA from 6.2.3. • Accept (–4 ; 0) or (4 ; ∞) • No part marks awarded for $-4 < x < 0$. Either 2 marks for correct answer or 0.

QUESTION/*VRAAG 7*

7.2.3	• CA from 7.2.2. • No marks for probabilities that are less than 0 or greater than 1.