

GRADE : 11
 SUBJECT : Mathematics
 TITLE : Paper 1
 EXAMINER : Mr A. Slaughter DOE
 TOTAL MARKS : 150

DATE : 3 / 11 / 20 15

SOLUTIONS

TIME : 3 hour(s)

| | | |
|------|---|--|
| 1.1. | <p>1. $x^2 - 7x + 12 = 0$ $(x-3)(x-4) = 0$ $\therefore x = 3 \text{ or } 4$</p> | |
| | | $\therefore \underline{-5 \leq x \leq 8}$ |
| | | |
| | <p>2. $6x - 7 = \frac{4}{x}$ LCD = x ($\because x \neq 0$) x thru $6x^2 - 7x = 4$ $6x^2 - 7x - 4 = 0$ $(\quad x \quad) = 0$</p> | <p>2. $-4x + 3 < -2$ $-4x < -5$ $x > \frac{5}{4}$</p> |
| | | $\underline{-5 \quad 8}$ and $\underline{0 \quad 4}$ $\underline{0 \quad 8}$ $\underline{5 \quad 4}$ |
| | <p>$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(-7) \pm \sqrt{(-7)^2 - 4(6)(-4)}}{2(6)}$ $= \frac{7 \pm \sqrt{145}}{12}$ $= \underline{1,59 \text{ or } -0,42}$</p> | <p>3. $\underline{0 \quad 8}$ and $\underline{0 \quad 4}$ $\underline{0 \quad 8}$ $\underline{5 \quad 4}$ $\therefore \text{ since } x \in \mathbb{N}$ $\therefore \underline{x = 2; 3; 4; 5; 6; 7}$ $\text{ or } 8$</p> |
| | | $\underline{0 \quad 4}$ $\underline{0 \quad 8}$ $\underline{5 \quad 4}$ $\therefore \text{ since } x \in \mathbb{N}$ $\therefore \underline{x = 2; 3; 4; 5; 6; 7}$ $\text{ or } 8$ |
| | | |
| | <p>1.2. 1. $x^2 - 3x \leq 40$ $x^2 - 3x - 40 \leq 0$ $(x-8)(x+5) \leq 0$ $\begin{array}{c} + \quad 0 \quad \ominus \quad 0 \quad + \\ \quad \quad \quad \\ -5 \quad \quad \quad 8 \end{array}$</p> | |

$$1.3. \quad m + \frac{1}{m} = 3$$

$$1.3. \quad 1. \quad \left(m + \frac{1}{m}\right)^2 = (3)^2$$

$$m^2 + 2 + \frac{1}{m^2} = 9$$

- 3 bs :

$$m^2 - 1 + \frac{1}{m^2} = 6 \rightarrow$$

$$2. \quad m^3 + \frac{1}{m^3}$$

$$= \left(m + \frac{1}{m}\right) \left(m^2 - 1 + \frac{1}{m^2}\right)$$

$$= (3)(6)$$

$$= 18 \rightarrow$$

$$2.1. \quad 1. \quad \sqrt{50} = \sqrt{25 \cdot 2}$$

$$= \sqrt{25} \cdot \sqrt{2}$$

$$= 5\sqrt{2}$$

$$\sqrt{8} = \sqrt{4 \cdot 2}$$

$$= \sqrt{4} \cdot \sqrt{2}$$

$$= 2\sqrt{2}$$

$$\therefore \frac{\sqrt{50} + \sqrt{8}}{7\sqrt{2}}$$

$$= \frac{5\sqrt{2} + 2\sqrt{2}}{7\sqrt{2}}$$

$$= \frac{7\sqrt{2}}{7\sqrt{2}}$$

$$= 1 \rightarrow$$

$$2.1. \quad 2. \quad \left. \begin{aligned} 16 &= 2^4 \\ 81 &= 3^4 \end{aligned} \right\} \checkmark$$

$$\sqrt{x} = x^{\frac{1}{2}} \checkmark$$

$$\therefore \left(\frac{16x^{-5/6}}{81\sqrt{x}}\right)^{-\frac{3}{4}}$$

$$= \left(\frac{2^4 \cdot x^{-5/6}}{3^4 \cdot x^{\frac{1}{2}}}\right)^{-\frac{3}{4}}$$

$$= \left(2^4 \cdot 3^{-4} \cdot x^{-\frac{5}{6} - \frac{1}{2}}\right)^{-\frac{3}{4}}$$

$$= \left(2^4 \cdot 3^{-4} \cdot x^{-\frac{4}{3}}\right)^{-\frac{3}{4}}$$

$$= (2^4)^{-\frac{3}{4}} (3^{-4})^{-\frac{3}{4}} (x^{-\frac{4}{3}})^{-\frac{3}{4}}$$

$$= 2^{-3} \cdot 3^3 \cdot x^1 \checkmark$$

$$= \frac{1}{2^3} \cdot 3^3 \cdot x$$

$$= \frac{27}{8} x \checkmark \rightarrow$$

$$2.2. \quad 27 = 3^3$$

$$9 = 3^2$$

$$27^{x^2+x} = 3^{3x^2} \cdot 9$$

$$(3^3)^{x^2+x} = 3^{3x^2} \cdot 3^2$$

$$3^{3x^2+3x} \checkmark = 3^{3x^2+2}$$

$$3 = 3$$

$$\therefore 3x^2 + 3x = 3x^2 + 2$$

$$3x = 2$$

$$x = \frac{2}{3} \checkmark$$

2.3.

$$5^{-x} = 10$$

$$\frac{2^{x-1} + 2^{x+1}}{5 \cdot 10^x}$$

$$10 = 5 \cdot 2$$

$$\therefore \frac{2^x \cdot 2^{-1} + 2^x \cdot 2^1}{5 \cdot (5 \cdot 2)^x}$$

$$= \frac{2^x (2^{-1} + 2) \checkmark}{5 \cdot 5^x \cdot 2^x \checkmark}$$

$$= \frac{\frac{1}{2} + 2}{5 \cdot 5^x}$$

$$= \frac{\frac{5}{2} \checkmark}{5 \cdot 5^x}$$

$$= \frac{5}{2} \times \frac{1}{5} \times 5^{-x}$$

$$= \frac{1}{2} \cdot 10 \checkmark$$

$$= 5 \checkmark$$

3.1.

$$x + y + 2 = 0$$

$$x^2 + y^2 = 4$$

$$y = -2 - x$$

$$x^2 + (-2-x)^2 = 4$$

$$x^2 + (4 + 4x + x^2) = 4$$

$$x^2 + 4 + 4x + x^2 = 4$$

$$2x^2 + 4x = 0$$

$$\div 2: x^2 + 2x = 0$$

$$x(x+2) = 0$$

$$x = 0 \text{ or } -2$$

$$\therefore y = -2 - 0 \text{ or } -2 - 2$$
$$= -2 \quad -4$$

$$\text{So } \underline{x = 0 \text{ and } y = -2}$$

or

$$\underline{x = -2 \text{ and } y = -4} \rightarrow$$

3.2.

$$\Delta = b^2 - 4ac$$

3.2.1. $a = -$ $b = +$ $c = 0$

$$\therefore \Delta = (+)^2 - 4(-)(0)$$
$$= (+)^2$$

So $\Delta > 0$ and

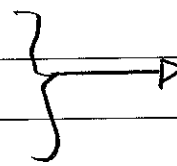
$\Delta =$ perfect square

\therefore roots will be

• real

• rational

• unequal



$$\forall b \in \mathbb{R}, b \neq 0 : \begin{array}{l} b^2 > 0 \\ -3b^2 < 0 \\ \Delta < 0 \end{array}$$

| | |
|--|--|
| 3.2. 2. $b^2 = ac$ $b \neq 0$ | 4. $T_n = a + (n-1)d$ |
| $\therefore \Delta = b^2 - 4b^2$ $ac - 4ac$ | $a = 92$ $d = -4$ |
| $= -3b^2$ $\leftarrow -3ac$ | |
| So $\Delta < 0$ | |
| \therefore roots will be | 4.1. $92; 88; 84$ |
| • <u>non-real</u> \rightarrow | |
| | |
| | 4.2. $T_n = 92 + (n-1)(-4)$ |
| 3.3. $2x^2 + 4x + 4 - p^2 = 0$ | $= 92 + (-4n + 4)$ |
| $\Delta = (4)^2 - 4(2)(4 - p^2)$ | $= 92 - 4n + 4$ |
| $= 16 - 4(8 - 2p^2)$ | $= 96 - 4n$ \rightarrow |
| $= 16 - 32 + 8p^2$ | |
| $= 8p^2 - 16$ | 4.3. $T_{18} = 96 - 4(18)$ |
| No real soln | $= 24$ \rightarrow |
| | |
| $\Delta < 0$ | 4.4. $T_p = 96 - 4p$ |
| $8p^2 - 16 < 0$ | $T_q = 96 - 4q$ |
| $p^2 - 2 < 0$ | |
| $(p - \sqrt{2})(p + \sqrt{2}) < 0$ | $T_p + T_q = 0$ |
| $\frac{+}{-\sqrt{2}} \frac{0}{-} \frac{-}{\sqrt{2}} \frac{0}{+}$ | $96 - 4p + 96 - 4q = 0$ |
| $\therefore -\sqrt{2} < p < \sqrt{2}$ | $192 = 4p + 4q$ |
| <u>$-1,41 < p < 1,41$</u> \rightarrow | $192 = 4(p+q)$ |
| | <u>$48 = p+q$</u> \rightarrow |
| | |
| | |
| | |
| | |
| | |

5.1. $41; 43; 47; 53; 61;$

$$\begin{array}{cccc} \checkmark & \checkmark & \checkmark & \checkmark \\ 2 & 4 & 6 & 8 \\ & \checkmark & \checkmark & \checkmark \\ & 2 & 2 & 2 \end{array}$$

5.1. 1. $d_2 = \underline{2} \rightarrow$

2. $d_2 = 2a$ $d_1 = 3a + b$ $T_1 = a + b + c$
 $2 = 2a$ $2 = 3(1) + b$ $41 = 1 + (-1) + c$
 $1 = a$ $-1 = b$ $41 = c$

$\therefore T_n = \underline{n^2 - n + 41} \rightarrow$

3. $T_{41} = (41)^2 - (41) + 41$
 $= 1681$

$\frac{1681}{41} = 41$

$\therefore 1681$ is NOT prime
 as its factors are
 not only 1 and
1681 \rightarrow

5.1. 4. Units digit n

| | | |
|---|----|----|
| 1 | 16 | ,2 |
| 3 | 27 | ,4 |
| 7 | 38 | ,6 |
| 3 | 49 | ,8 |
| 1 | 50 | ,0 |

$\frac{49 \ 999 \ 998}{5}$

$= 99 \ 999 \ 99, 6$

\therefore units digit = 7 \rightarrow

5.2. $T_n = -5n - 4$ n even
 $T_n = -n^2 + 6$ n odd

1. $T_6 + T_7$
 $= -5(6) - 4 + (-7)^2 + 6$
 $= -34 + (-43)$
 $= -34 - 43$
 $= \underline{-77} \rightarrow$

2. Try: $T_k = -5k - 4$
 $-219 = -5k - 4$
 $5k = 215$
 $k = 43$
 reject
 even formula, odd k

$$T_k = -k^2 + 6$$

$$-219 = -k^2 + 6$$

$$k^2 = 225$$

$$k = \pm \sqrt{225}$$

$$k = 15$$

odd formula, odd k

$$\therefore k = 15$$



6.1.
$$A = P(1-i)^n$$
$$= 540000 \left(1 - \frac{11}{100}\right)^8$$
$$= \underline{R\ 212\ 575,80}$$
▷

6.2.
$$1 + i_{ea} = \left(1 + \frac{i_k}{k}\right)^k$$

$$1 + i_{ea} = \left(1 + \frac{11,5}{400}\right)^4$$

$$1 + i_{ea} = 1,12\dots$$

$$i_{ea} = 0,12\dots$$

$$\therefore i_{ea} = 0,12\dots \times 100$$

$$= \underline{12,01\ \% \text{ pa}}$$
▷

6.3. R 15000 8 years

6.3.1. Vishnu :

$$A = P(1+in)$$
$$= 15000 \left(1 + \frac{8,7}{100} \cdot 8\right)$$
$$= 25\ 440$$

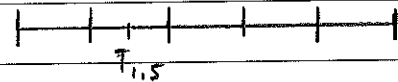
$$\text{Bonus} = \frac{3}{100} \cdot 15000$$
$$= 450$$

$$\therefore \text{Total} = 25\ 440 + 450$$
$$= \underline{R\ 25\ 890}$$
▷

2. Landi :

$$A = P(1+i)^n$$
$$= 15000 \left(1 + \frac{6,9}{1200}\right)^{96}$$
$$= \underline{R\ 26\ 009,69}$$
▷

6.4. $T_0 \quad T_1 \quad T_2 \quad T_3 \quad T_4 \quad T_5$



in x out 2000 23564

12 % pa monthly

$$A = P(1+i)^n$$

$$T_0 - T_{1,5}$$

$$A = x \left(1 + \frac{12}{1200}\right)^{18}$$
$$= x \left(\frac{101}{100}\right)^{18}$$

$$T_{1,5} - T_5$$

$$23564 = \left(x \left(\frac{101}{100}\right)^{18} - 2000\right) \left(1 + \frac{12}{1200}\right)^{42}$$
$$15514,98\dots = x \left(\frac{101}{100}\right)^{18} - 2000$$
$$\underline{R\ 14642,83 = x}$$

(OR)

$$T_{1,5} - T_5$$

$$23564 = P \left(1 + \frac{12}{1200}\right)^{42}$$
$$15514,98\dots = P$$

$$T_0 - T_{1,5}$$

$$17514,98\dots = x \left(1 + \frac{12}{1200}\right)^{18}$$
$$\underline{R\ 14642,83 = x}$$

$$7. \quad h: y = \frac{1}{x} + 5 \quad g: y = x + 5$$

$$7.1. \quad h \text{ xint: } 0 = \frac{1}{x} + 5$$

$$-5 = \frac{1}{x}$$

$$\text{LCD} = x \quad (\because x \neq 0)$$

$$x \cdot \text{thru}$$

$$-5x = 1$$

$$\underline{x = -\frac{1}{5}}$$

$$\text{ie } \left(-\frac{1}{5}; 0\right)$$

$$7.2. \quad h: y = \frac{1}{x} + 5$$

$$\underline{y\text{int:}} \quad y = \frac{1}{0} + 5$$
$$= \text{UD}$$

\therefore no y int

$$\underline{x\text{int:}} \quad x = -\frac{1}{5} \quad (7.1.)$$

$$\underline{h_a:} \quad y = 5$$

$$\underline{v_a:} \quad x = 0$$

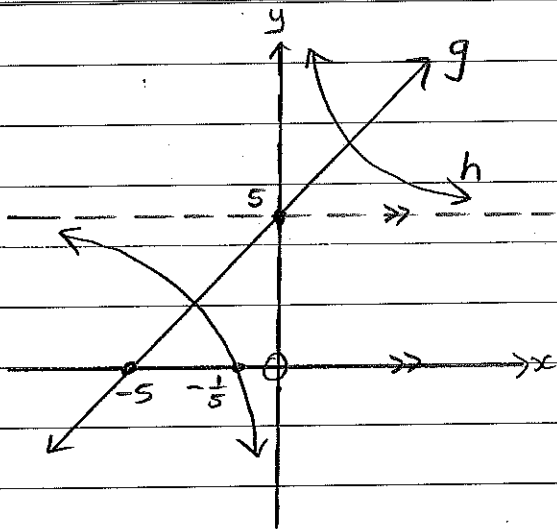
$$\underline{\text{shape:}} \quad k = + \quad \therefore \quad \begin{matrix} \nearrow \\ \leftarrow \\ \searrow \end{matrix}$$

$$g: \quad y = x + 5$$

$$\underline{y\text{int:}} \quad y = 5$$

$$\underline{x\text{int:}} \quad 0 = x + 5$$

$$-5 = x$$



7.3. h va: $x=0$

7.4. $y = \frac{1}{x} + 5$ $y = x + 5$

$\therefore x + 5 = \frac{1}{x} + 5$
 $LCO = x$ ($\because x \neq 0$)
 x thru

$$x^2 + 5x = 1 + 5x$$

$$x^2 = 1$$

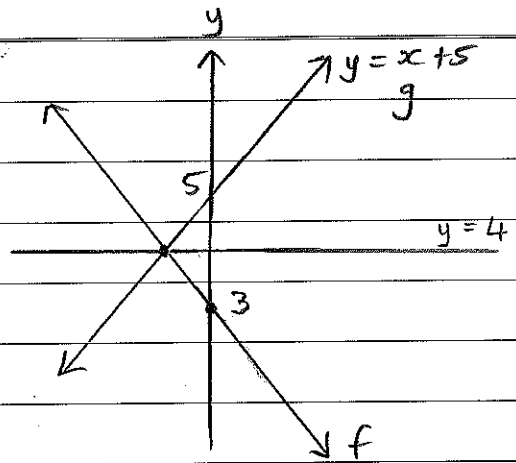
$$x = \pm 1$$

$$\therefore y = \pm 1 + 5$$

$$= 6 \text{ or } 4$$

$\therefore (1; 6) \text{ and } (-1; 4)$

7.5.



$f: y = -x + 3$

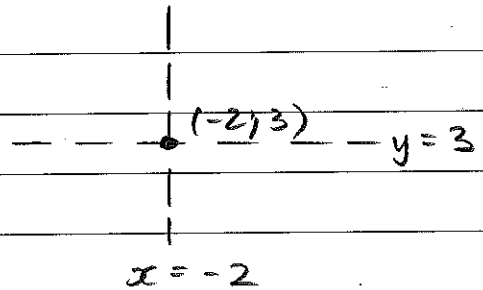
Check: $y=4 \therefore 4 = x + 5$

$$-1 = x$$

$(-1; 4)$ $(0; 3)$

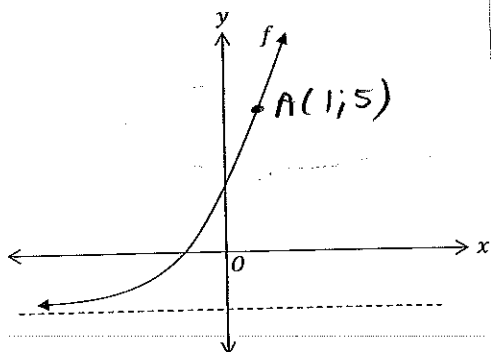
$$m = \frac{3-4}{0-(-1)} = -1 \quad \text{OK}$$

7.6.



$\therefore y = \frac{1}{x+2} + 3$

$$8. \quad y = 2 \cdot a^x - 1$$



$$8.1. \quad y = 2a^x - 1$$

Sub $A(1, 5)$

$$5 = 2 \cdot a^1 - 1$$

$$6 = 2a$$

$$3 = a$$

→

$$\boxed{y = 2 \cdot 3^x - 1}$$

$$8.2. \quad \underline{y_{int}}: \quad y = 2 \cdot 3^0 - 1$$

$$= 1$$

ie $(0, 1)$

$$8.3. \quad \text{ha: } y = -1$$

$$\therefore y \in (-1, \infty)$$

$$y > -1$$

$$8.4. \quad f(x) = 2 \cdot 3^x - 1$$

$$f(0,23) = 2 \cdot 3^{0,23} - 1$$

$$= 1,575 \rightarrow$$

$$8.5. \quad y = 2 \cdot 3^x - 1$$

• reflect x axis

$$y \rightarrow -y$$

$$\therefore -y = 2 \cdot 3^x - 1$$

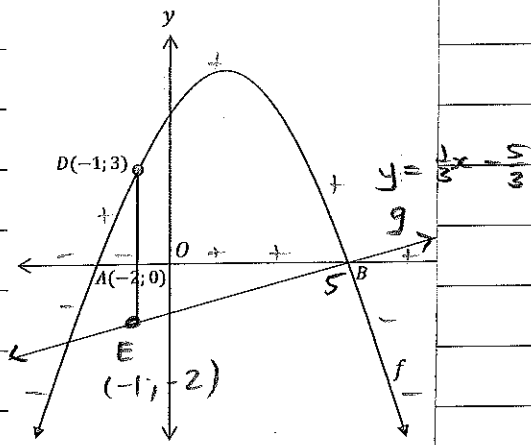
$$\therefore y = -2 \cdot 3^x + 1$$

• translate 2 units \leftarrow

$$x \rightarrow x + 2$$

$$\therefore y = -2 \cdot 3^{x+2} + 1 \rightarrow$$

9. $f: y = ax^2 + bx + c$
 $g: 3y = x - 5$



9.3. $x_{tp} = \frac{-2+5}{2}$ (OR) $\frac{-(-\frac{3}{2})}{2(-\frac{1}{2})}$
 $= \frac{3}{2}$

$y_{tp} = -\frac{1}{2}\left(\frac{3}{2}\right)^2 + \frac{3}{2}\left(\frac{3}{2}\right) + 5$
 $= \frac{49}{8}$

$\therefore \left(\frac{3}{2}; \frac{49}{8}\right)$
 $1\frac{1}{2} \quad 1,5 \quad 6,13 \quad 6\frac{1}{8}$

9.4. $E: x = -1$
 $\therefore y = \frac{1}{3}(-1) - \frac{5}{3}$
 $=$

$\therefore E(-1; -2)$

$D(-1; 3)$

$\therefore DE = y_D - y_E$
 $= 3 - (-2)$
 $= 5$

9.1. $g \text{ xint: } 3(0) = x - 5$
 $5 = x$
 $\therefore \underline{B(5; 0)}$

9.2. $y = a(x+2)(x-5)$
 sub $D(-1; 3)$
 $3 = a(-1+2)(-1-5)$
 $3 = a(1)(-6)$
 $3 = -6a$
 $-\frac{1}{2} = a$
 $\therefore y = -\frac{1}{2}(x+2)(x-5)$
 $= -\frac{1}{2}(x^2 - 3x - 10)$
 $= -\frac{1}{2}x^2 + \frac{3}{2}x + 5$

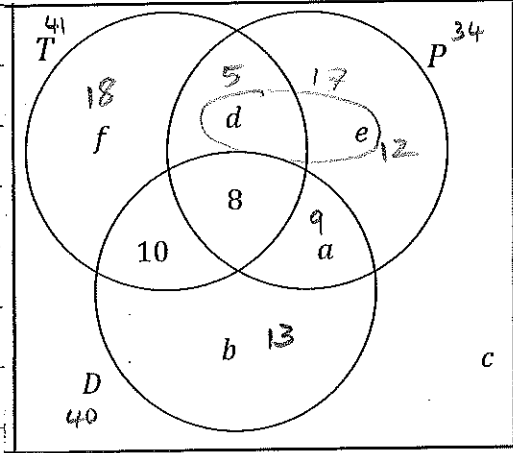
9.5. Av grad $B(5; 0) D(-1; 3)$
 $= \frac{3-0}{-1-5}$
 $= -\frac{1}{2}$

9.6. $x \cdot f(x) \geq 0$
 $x \cdot y_f \geq 0$

$\therefore x \in (-\infty; -2] \text{ or } [0; 5]$

10.

$$\cancel{U} = 84$$



$$41 + 12 + 9 + 13 + c = 84$$

$$c = 9$$

$$\therefore a = 9$$

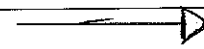
$$b = 13$$

$$c = 9$$

$$d = 5$$

$$e = 12$$

$$f = 18$$



10.1. $n(P \text{ and } D) = 17$

$$8 + a = 17$$

$$a = 9$$

$$10 + 8 + 9 + b = 40$$

$$b = 13$$

$$8 + 9 + d + e = 34$$

$$d + e = 17$$

$$f + 17 + 40 = 75$$

$$f = 18$$

$$d + 18 + 18 = 41$$

$$d = 5$$

$$5 + e = 17$$

$$e = 12$$

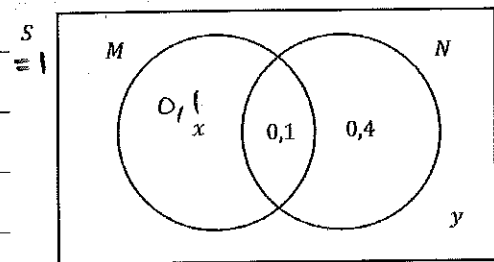
10.2. $P(\text{@ least 2 of 3})$

$$= \frac{10 + 5 + 9 + 8}{84}$$

$$= \frac{32}{84}$$

$$= \frac{8}{21} \rightarrow 0,38$$

11.



Independent events

$$\checkmark \therefore P(M \cap N) = P(M) \times P(N)$$

$$\checkmark 0,1 = (0,1 + x)(0,1 + 0,4)$$

$$\checkmark 0,2 = 0,1 + x$$

$$\checkmark 0,1 = x \rightarrow$$

$$\checkmark 0,1 + 0,1 + 0,4 + y = 1$$

$$y = 0,4 \rightarrow$$

11.2. 1. $P(\text{Female} \cap \text{Fail})$

$$= \frac{16}{100}$$

$$= \frac{4}{25} \rightarrow 0,16$$

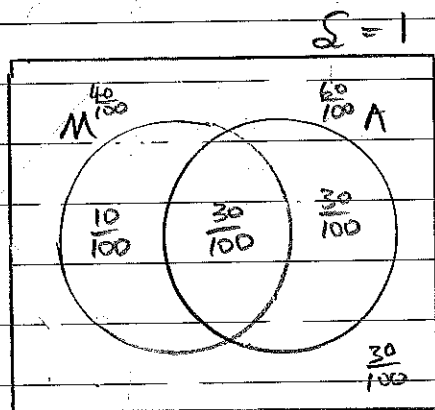
2. Given male

$$\therefore n(M) = 37$$

$P(\text{Passed, given } M)$

$$= \frac{30}{37} \rightarrow$$

11.3.



Pass Maths M

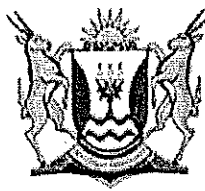
Pass Acc A

$P(\text{fail } M \text{ and } A)$

$$= \frac{30}{100}$$

$$= \frac{3}{10} \rightarrow$$

SUT



Province of the
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**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 11

NOVEMBER 2015

**MATHEMATICS P1/WISKUNDE V1
MEMORANDUM**

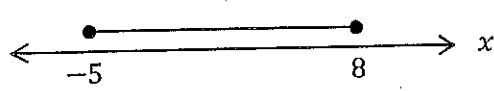
MARKS/PUNTE: 150

Hierdie memorandum bestaan uit 14 bladsye./
This memorandum consists of 14 pages.

NOTE/LET OP:

- If a candidate answered a question TWICE, mark the FIRST attempt ONLY.
Indien 'n kandidaat 'n vraag TWEE keer beantwoord het, merk SLEGS die EERSTE poging.
- Consistent accuracy applies in ALL aspects of the memorandum.
Volgehoue akkuraatheid geld deurgaans in ALLE aspekte van die memorandum.
- If a candidate crossed out an attempt of a question and did not redo the question, mark the crossed-out attempt.
Indien 'n kandidaat 'n poging vir 'n vraag deurgetrek het en nie die vraag weer beantwoord het nie, merk die poging wat deurgetrek is.
- The mark for substitution is awarded for substitution into the correct formula.
Die punt vir substitusie word toegeken vir substitusie in die korrekte formule.

QUESTION 1/VRAAG 1

| | | | |
|-------|---|---|---|
| 1.1.1 | $x^2 - 7x + 12 = 0$ $(x - 4)(x - 3) = 0$ ✓ $x = 4$ or/of $x = 3$ ✓ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Answer ONLY: 1 mark. SLEGS antwoord: 1 punt. </div> | ✓ factors/faktore ✓ x-values/waardes (2) | 2 |
| 1.1.2 | $6x - 7 = \frac{4}{x}$ $6x^2 - 7x = 4$ $6x^2 - 7x - 4 = 0$ ✓ $x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(6)(-4)}}{2(6)}$ ✓ $x = \frac{7 \pm \sqrt{145}}{12}$ ✓ $x = 1,59$ or/of $x = -0,42$ ✓ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> If answer left in surd form: 3 marks. Indien antwoord in wortelvorm gelaat: 3 punte. </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Penalise 1 mark for incorrect rounding off. Penaliseer 1 punt vir verkeerde afronding. </div> | ✓ standard form/standaardvorm. ✓ substitution/substitusie ✓✓ x-values/waardes (4) | 4 |
| 1.2.1 | $x^2 - 3x \leq 40$ $x^2 - 3x - 40 \leq 0$ ✓ $(x - 8)(x + 5) \leq 0$ ✓ $-5 \leq x \leq 8$ ✓ OR/OF $x \in [-5; 8]$ ✓ OR/OF  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Note/Let op: If/As $x \leq -5$ or/of $x \leq 8$: max./maks. 2 marks/punte. If correct graphical solution but concludes incorrectly: max. 3 marks. As korrekte grafiese oplossing, maar maak verkeerde gevolgtrekking: maks. 3 punte. </div> | ✓ standard form/standaardvorm ✓ factors/faktore ✓ critical values/kritieke waardes ✓ solution/oplossing (4) | 4 |

| | | |
|-------|---|---|
| 1.2.2 | $-4x + 3 < -2$ $-4x < -5$ $x > \frac{5}{4}$ ✓ $\frac{5}{4}$ ✓ <i>value</i> | ✓ $-4x < -5$ ✓ solution/oplossing (2) |
| 1.2.3 | $x \in \{2; 3; 4; 5; 6; 7; 8\}$ ✓ ✓ <i>-1 each error or</i> <i>or 1/1/1/1/1/1/1</i> If/As $2 \leq x \leq 8$, 1 mark/punt. | ✓ 4 values/waardes ✓ 7 values/waardes (2) |
| 1.3.1 | $m + \frac{1}{m} = 3$ $(m + \frac{1}{m})^2 = 9$ ✓ $m^2 + 2 + \frac{1}{m^2} = 9$ ✓ $m^2 + 2 - 3 + \frac{1}{m^2} = 9 - 3$ $m^2 - 1 + \frac{1}{m^2} = 6$ ✓ → If answer = 8: 2 marks./As antwoord = 8: 2 punte. Used/gebruik $m^2 + \frac{1}{m^2} = 9$ If answer = 10: 1 mark./As antwoord = 10: 1 punt | ✓ squaring/kwadrering ✓ simplification/vereenvoudiging ✓ answer/antwoord (3) |
| 1.3.2 | $m^3 + \frac{1}{m^3} = (m + \frac{1}{m})(m^2 - 1 + \frac{1}{m^2})$ ✓ $= (3)(6)$ $= 18$ ✓ → If no factors shown but correct answer: 0 marks. As geen faktore maar regte antwoord: 0 punte. | ✓ factors/faktore ✓ answer/antwoord (2) |

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[19]

QUESTION 2/VRAAG 2

| | | |
|--------------|--|--|
| <p>2.1.1</p> | $\frac{\sqrt{50} + \sqrt{8}}{7\sqrt{2}}$ $= \frac{5\sqrt{2} + 2\sqrt{2}}{7\sqrt{2}}$ $= \frac{7\sqrt{2}}{7\sqrt{2}}$ $= 1$ <p style="text-align: center;">2.5 x 2 4 x 2 ✓</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Answer ONLY: 0 marks. SLEGS antwoord: 0 punte.</p> </div> <p>OR/OF</p> $\frac{\sqrt{50} + \sqrt{8}}{7\sqrt{2}}$ $= \frac{(50)^{\frac{1}{2}} + (8)^{\frac{1}{2}}}{7 \cdot (2)^{\frac{1}{2}}}$ $= \frac{(5^2 \cdot 2)^{\frac{1}{2}} + (2^3)^{\frac{1}{2}}}{7 \cdot (2)^{\frac{1}{2}}}$ $= \frac{5 \cdot (2)^{\frac{1}{2}} + (2)^{\frac{3}{2}}}{7 \cdot (2)^{\frac{1}{2}}}$ $= \frac{(2)^{\frac{1}{2}} [5 + 2]}{7 \cdot (2)^{\frac{1}{2}}}$ $= \frac{7}{7}$ $= 1$ | <p>✓ $5\sqrt{2} + 2\sqrt{2}$</p> <p>✓ $7\sqrt{2}$</p> <p>✓ answer/antwoord</p> <p>✓ $5 \cdot (2)^{\frac{1}{2}} + (2)^{\frac{3}{2}}$</p> <p>✓ $7 \cdot (2)^{\frac{1}{2}}$</p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(3)</p> |
| <p>2.1.2</p> | $\left[\frac{16x^{-5}}{81\sqrt{x}} \right]^{\frac{-3}{4}}$ $= \left[\frac{2^4 x^{-5}}{3^4 x^{\frac{1}{2}}} \right]^{\frac{-3}{4}}$ $= \left[\frac{3^4 x^{\frac{1}{2}}}{2^4 x^{-5}} \right]^{\frac{3}{4}}$ $= \frac{3^3 x^{\frac{3}{8}}}{2^3 x^{-\frac{5}{8}}}$ $= \frac{27x}{8}$ <p style="text-align: center;">2⁴ ✓ 3⁴ ✓ x^{1/2} ✓</p> <p>OR/OF</p> $= \frac{2^{-3} x^{\frac{5}{8}}}{3^{-3} x^{-\frac{3}{8}}}$ $= \frac{3^3 x}{2^3}$ $= \frac{27x}{8}$ | <p>✓ $3^4; 2^4$ and/en $x^{\frac{1}{2}}$</p> <p>✓ rule/reël</p> <p>✓ rule/reël</p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(4)</p> |
| <p>2.2</p> | $27x^2 + x = 3^{3x^2} \times 9$ $(3^3)^{x^2 + x} = 3^{3x^2} \times 3^2$ $3^{3x^2 + 3x} = 3^{3x^2} \times 3^2$ $\therefore 3x^2 + 3x = 3x^2 + 2$ $3x = 2$ $x = \frac{2}{3}$ <p style="text-align: center;">✓ equate exp</p> | <p>✓ $3^{3x^2 + 3x}$</p> <p>✓ $3x^2 + 3x = 3x^2 + 2$</p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(3)</p> |

3

4

3

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| <p>2.3</p> | $\frac{2^{x-1} + 2^{x+1}}{5 \times 10^x}$ $= \frac{2^x(2^{-1} + 2)}{5 \times 5^x \times 2^x}$ $= \frac{5 \times 5^x \times 2^x}{2^{-1} + 2}$ $= \frac{5 \times 5^x}{\frac{1}{2} + 2}$ $= \frac{5 \times 5^x}{2 \frac{1}{2} \times 5^{-x}}$ $= \frac{5}{2 \frac{1}{2} \times 10}$ $= \frac{5}{5}$ <p>OR/OF</p> <p>If/As $5^{-x} = 10$ then/dan $5^x = 10^{-1} = \frac{1}{10}$</p> $\frac{2^{x-1} + 2^{x+1}}{5 \times 10^x}$ $= \frac{2^x(2^{-1} + 2)}{5 \times 5^x \times 2^x}$ $= \frac{5 \times 5^x}{2^{-1} + 2}$ $= \frac{5 \times 5^x}{\frac{1}{2} + 2}$ $= \frac{2 \frac{1}{2}}{5 \times 5^x}$ $= \frac{2 \frac{1}{2}}{5 \times \frac{1}{10}}$ $= \frac{2 \frac{1}{2}}{\frac{1}{2}}$ $= 5$ | $\checkmark 2^x(2^{-1} + 2)$ $\checkmark 5^x \times 2^x$ $\checkmark \frac{1}{2} + 2$ $\checkmark 5^{-x}$ $\checkmark 5$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Answer ONLY: 0 marks. SLEGS antwoord: 0 punte. </div> $\checkmark 2^x(2^{-1} + 2)$ $\checkmark 5^x \times 2^x$ $\checkmark \frac{1}{2} + 2$ $\checkmark 5^x = \frac{1}{10}$ $\checkmark 5$ |
| | (5) | |
| | | [15] |

5

QUESTION 3/VRAAG 3

| | | | |
|-------|---|--|--|
| 3.1 | $x + y + 2 = 0$ $x = -y - 2$ ✓ $x^2 + y^2 = 4$ $(-y - 2)^2 + y^2 = 4$ ✓ $y^2 + 4y + 4 + y^2 = 4$ $2y^2 + 4y = 0$ $y(y + 2) = 0$ ✓ $y = 0$ or/of $y = -2$ ✓ $x = -2$ or/of $x = 0$ ✓ | $x + y + 2 = 0$ $y = -x - 2$ $x^2 + y^2 = 4$ $x^2 + (-x - 2)^2 = 4$ $x^2 + x^2 + 4x + 4 = 4$ $2x^2 + 4x = 0$ see $2x(x + 2) = 0$ ✓ $x = 0$ or/of $x = -2$ $y = -2$ or/of $y = 0$ | ✓ $x = -y - 2 / y = -x - 2$ ✓ substitution/substitusie ✓ standard form/standaardvorm ✓ factors/faktore ✓ y-values /-waardes ✓ x-values /-waardes (6) |
| 3.2.1 | $b^2 - 4ac = (+)^2 - 4(-)(0) = (+)^2$ ✓ Roots are <u>rational and unequal</u> and real ✓ Wortels is rasonaal en ongelyk <div style="border: 1px solid black; padding: 2px; width: fit-content;"> No mark for answer if no method is shown. Geen punt vir antwoord as geen metode aangedui word nie. </div> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> If candidate includes "non-real": max 1 mark. As kandidaat "nie-reëel" insluit: maks 1 punt. </div> | ✓ method/metode ✓ rational AND unequal/ rasonaal EN ongelyk (2) | |
| 3.2.2 | $b^2 - 4ac = b^2 - 4b^2 = -3b^2$ ✓ <div style="border: 1px solid black; padding: 2px; width: fit-content;"> No mark for answer if no method is shown. Geen punt vir antwoord as geen metode aangedui word nie. </div> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> No marks if contradictions are given, e.g. unequal. Geen punt as teenstrydighede genoem word nie, bv. ongelyk. </div> Roots are nonreal/Wortels is nie-reëel. ✓ | ✓ $-3b^2$ ✓ answer/antwoord (2) | |
| 3.3 | $2x^2 + 4x + 4 - p^2 = 0$ $b^2 - 4ac = 16 - 4(2)(4 - p^2)$ ✓ $= 16 - 32 + 8p^2$ $= 8p^2 - 16$ For non-real solution/ Vir nie-reële wortels: $8p^2 - 16 < 0$ ✓ $p^2 - 2 < 0$ $(p - \sqrt{2})(p + \sqrt{2}) < 0$ ✓ CV $-\sqrt{2} < p < \sqrt{2}$ ✓ | ✓ substitution/substitusie ✓ statement/stelling ✓ critical values/kritieke waardes ✓ answer/antwoord (4) | |

[14]

QUESTION 4/VRAAG 4

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|-----|--|---|---|
| 4.1 | 88 ; 84 ✓ → | ✓ 88 ; 84 (1) | 1 |
| 4.2 | $T_n = -4n + 96$ ✓ ✓ → OR/OF $T_n = 92 + (n - 1)(-4)$ ← penalty no bracket around -4 | ✓ $-4n$ ✓ 96 ✓ $d = -4$ ✓ substitution/substitutisie (2) | 2 |
| 4.3 | $T_{18} = -4(18) + 96$ ✓ OR/OF ✓ $T_{18} = 92 + 17(-4)$ = 24 ✓ = 24 → | ✓ substitution/substitutisie ✓ answer/antwoord (2) | 2 |
| 4.4 | $T_p + T_q = 0$ $96 - 4p + 96 - 4q = 0$ ✓ $-4p - 4q = -192$ $p + q = 48$ ✓ → OR/OF 92; 88; 84; 80; 76; 72; 68; 64; 60; 56; 52; 48; 44; 40; 36; 32; 28; 24; 20; 16; 12; 8; 4; 0; -4; ... $T_{23} + T_{25} = 4 + (-4) = 0$ $p + q = 48$ | ✓ substitution/substitutisie ✓ answer/antwoord <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Answer ONLY: 1 mark. SLEGS antwoord: 1 punt.</div> ✓ expansion/uitbreiding ✓ answer/antwoord (2) | 2 |
| | | (7) | |

QUESTION 5/VRAAG 5

| | | | |
|-------|---|---|---|
| 5.1.1 | 2 → ✓ | ✓ answer/antwoord (1) | 1 |
| 5.1.2 | $2a = 2$ $a = 1$ ✓ $3a + b = 2$ $3 + b = 2$ $b = -1$ ✓ $a + b + c = 41$ $1 - 1 + c = 41$ $c = 41$ ✓ $T_n = n^2 - n + 41$ ✓ OR/OF $T_n = an^2 + bn + c$ $a + b + c = 41$ (1) $4a + 2b + c = 43$ (2) $9a + 3b + c = 47$ (3) $(2) - (1)$ $3a + b = 2$ $(3) - (2)$ $5a + b = 4$ $2a = 2$ $a = 1$ $b = -1$ $c = 41$ $T_n = n^2 - n + 41$ | ✓ a-value/waarde ✓ b-value/waarde ✓ c-value/waarde ✓ answer/antwoord Answer ONLY: 3 marks. SLEGS antwoord: 3 punte. ✓ a-value/waarde ✓ b-value/waarde ✓ c-value/waarde ✓ answer/antwoord (4) | 4 |
| 5.1.3 | $T_{41} = 41^2 - 41 + 41 = 1681$ ✓ 41 is also a factor/41 is ook 'n faktor. ∴ Factors/faktore: 1, 1681 and/en 41. ✓ ∴ 1681 is not prime/nie priem nie. | ✓ 1681 ✓ argument (2) | 2 |
| 5.1.4 | Units digits/ensyfers: 1,3,7,3,1 , 1,3,7,3,1 , 1,3,7,3,1, ... ✓ $49\,999\,998 \div 5 = 9\,999\,999,6$ Decimal/desimaal = $0,6 = \frac{3}{5}$ Units digit/ensyfer = 7 → ✓ | ✓ identify pattern/identifiseer patroon Answer ONLY: 2 marks. SLEGS antwoord: 2 punte. ✓ answer/antwoord (2) | 2 |
| 5.2.1 | $T_6 + T_7 = -5(6) - 4 - (7)^2 + 6$ ✓ $= -30 - 4 - 49 + 6$ ✓ $= -77$ ✓ | ✓ $-5(6) - 4$ ✓ $-(7)^2 + 6$ ✓ answer/antwoord (3) | 3 |

| | | | |
|-------|---|---|---|
| 5.2.2 | $-5k - 4 = -219$ $-5k = -215$ $k = 43$ $-k^2 + 6 = -219$ $k^2 = 225$ $k = 15$ $\therefore k = 15$ | If ONLY/Indien SLEGS: $-k^2 + 6 = -219$ $k^2 = 225$ $k = 15$ 4 marks/punte. If continues and mentions that $k = 15$ is uneven: 5 marks. As voortgaan en meld dat $k = 15$ is onewe: 5 punte | ✓ $-5k - 4 = -219$ ✓ answer/antwoord ✓ $-k^2 + 6 = -219$ ✓ answer/antwoord ✓ choice/keuse |
| | | | (5) |
| | | | [17] |

If expansion that leads to correct answer: 5 marks.
 As uitbreiding wat tot korrekte antwoord lei: 5 punte.
 If ONLY expansion: 2 marks.
 Indien SLEGS uitbreiding: 2 punte.

| | | | | | | | | | | | | | | |
|------------|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|
| n = uneven | 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | | | | | | |
| T_n | 5 | -3 | -19 | -43 | -75 | -115 | -163 | -219 | | | | | | |
| n = even | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 |
| T_n | -14 | -24 | -34 | -44 | -54 | -64 | -74 | -84 | -94 | -104 | -114 | -124 | -134 | -144 |
| n = even | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | | | | | | |
| T_n | -154 | -164 | -174 | -184 | -194 | -204 | -214 | -224 | | | | | | |

QUESTION 6/VRAAG 6

| | | | |
|-------|---|--|--|
| 6.1 | $A = P(1 - i)^n$ $A = 540\,000(1 - 0,11)^8$ $A = R212\,575,80$ | Wrong formule/verkeerde formule: 0 marks/punte. | ✓ substitution/substitusie ✓ answer/antwoord |
| 6.2 | $1 + i_{eff} = \left(1 + \frac{0,115}{4}\right)^4$ $1 + i_{eff} = 1,12005 \dots$ $i_{eff} = 0,12005 \dots$ $= 12,01\%$ | Wrong formule/verkeerde formule: 0 marks/punte. If answer given as 12%: 2 marks. Indien antwoord gegee as 12%: 2 punte. | ✓ substitution/substitusie ✓ 1,12005 ... ✓ answer/antwoord |
| 6.3.1 | $A = 15\,000(1 + 0,087 \times 8) + \frac{3}{100} \times 15\,000$ $= 25\,440 + 450$ $= R25\,890$ | If ONLY/Indien SLEGS: $15\,000(1 + 0,087 \times 8)$ 1 mark/punt. | ✓ $15\,000(1 + 0,087 \times 8)$ ✓ $\frac{3}{100} \times 15\,000$ ✓ answer/antwoord |
| 6.3.2 | $A = 15\,000 \left(1 + \frac{0,069}{12}\right)^{96}$ $= R26\,009,69$ | Wrong formule/ Verkeerde formule: 1 mark/punt for/vir i . | ✓ $i = \frac{0,069}{12}$ ✓ substitution/substitusie ✓ answer/antwoord |

| | |
|---|--|
| <p>6.4</p> <p> $P_2 = \left[23\,564 \left(1 + \frac{0,12}{12} \right)^{-42} + 2000 \right] \left(1 + \frac{0,12}{12} \right)^{-18}$ $= R14\,642,83$ </p> <p>OR/OF</p> <p> $P_1 \left(1 + \frac{0,12}{12} \right)^{42} = 23\,564$ $P_1 = \frac{23\,564}{\left(1 + \frac{0,12}{12} \right)^{42}} = 15\,514,98\dots$ </p> <p> $P_2 \left(1 + \frac{0,12}{12} \right)^{18} = P_1 + 2\,000$ $P_2 = \frac{P_1 + 2\,000}{\left(1 + \frac{0,12}{12} \right)^{18}} = 17\,514,98\dots$ $P_2 = R14\,642,83$ </p> <p>OR/OF</p> <p> $\left[x \left(1 + \frac{0,12}{12} \right)^{18} - 2000 \right] \left(1 + \frac{0,12}{12} \right)^{42} = 23\,564$ $x \left(1 + \frac{0,12}{12} \right)^{18} - 2000 = 15\,514,98340$ $x \left(1 + \frac{0,12}{12} \right)^{18} = 17\,514,9834$ $x = R14\,642,83$ </p> | <p> $\checkmark i = \frac{0,12}{12}$ $\checkmark 23\,564 \left(1 + \frac{0,12}{12} \right)^{-42}$ $\checkmark +2000$ $\checkmark \left(1 + \frac{0,12}{12} \right)^{-18}$ $\checkmark \text{ answer/antwoord}$ </p> <p> $\checkmark i = \frac{0,12}{12}$ $\checkmark P_1 \left(1 + \frac{0,12}{12} \right)^{42} = 23\,564$ $\checkmark P_1 + 2\,000$ $\checkmark P_2 \left(1 + \frac{0,12}{12} \right)^{18} = P_1 + 2\,000$ $\checkmark \text{ answer/antwoord}$ </p> <p> $\checkmark i = \frac{0,12}{12}$ $\checkmark x \left(1 + \frac{0,12}{12} \right)^{18} - 2000$ $\checkmark \left(1 + \frac{0,12}{12} \right)^{42}$ $\checkmark x \left(1 + \frac{0,12}{12} \right)^{18} = 17\,514,9834$ $\checkmark \text{ answer/antwoord}$ </p> <p style="text-align: right;">(5)</p> |
| | [16] |

5

QUESTION 7/VRAAG 7

| | | |
|------------|---|--|
| <p>7.1</p> | <p>$h(x) = \frac{1}{x} + 5$ Let/stel $y = 0$ $0 = \frac{1}{x} + 5$ $0 = 1 + 5x$ $-5x = 1$ $x = \frac{1}{-5}$</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Answer ONLY $x = \frac{1}{-5}$: 2 marks. SLEGS antwoord $x = \frac{1}{-5}$: 2 punte.</p> </div> | <p>✓ $y = 0$ ✓ simplify/vereenvoudig ✓ answer/antwoord (3)</p> |
| <p>7.2</p> | | <p>h ✓ x-intercept/afsnit ✓ asymptote/asimptoot ✓ shape/vorm h g ✓ y-intercept/afsnit ✓ x-intercept/afsnit (5)</p> |
| <p>7.3</p> | <p>$x = 0$</p> | <p>✓ answer/antwoord (1)</p> |
| <p>7.4</p> | <p>$x + 5 = \frac{1}{x} + 5$ $x^2 + 5x = 1 + 5x$ $x^2 - 1 = 0$ $(x - 1)(x + 1) = 0$ $x = 1$ or/of $x = -1$ $(1; 6)$ or/of $(-1; 4)$</p> | <p>✓ equation/vergelijking ✓ simplify/vereenvoudig ✓ x-values/waardes ✓ $(1; 6)$ ✓ $(-1; 4)$ (5)</p> |
| <p>7.5</p> | <p>$f(x) = -x + 3$</p> | <p>✓ $-x$ ✓ 3 (2)</p> |
| <p>7.6</p> | <p>$h(x) = \frac{1}{x+2} + 3$</p> | <p>✓ $x + 2$ ✓ +3 (2) [18]</p> |

3
 3
 1
 5
 2
 2

QUESTION 8/VRAAG 8

| | | | |
|-----|--|--|---|
| 8.1 | $f(x) = 2 \times a^x - 1$ $5 = 2 \cdot a^1 - 1$ ✓ $6 = 2a$ ✓ $a = 3$ ✓ <i>Sub (1; 5)</i> | ✓ substitution/substitusie ✓ simplify/vereenvoudig (2) | 2 |
| 8.2 | $f(x) = 2 \cdot 3^x - 1$ $y = 2 \cdot 3^0 - 1$ ✓ $y = 2 - 1$ $y = 1$ ✓ | ✓ $x = 0$ ✓ $y = 1$ (2) | 2 |
| 8.3 | $y > -1$ ✓ $y \in (-1; \infty)$ | ✓ answer/antwoord (1) | 1 |
| 8.4 | $f(0,23) = 2 \times 3^{0,23} - 1$ ✓ $= 1,575$ ✓ <i>3 dp</i> | ✓ substitution/substitusie ✓ answer/antwoord (2) | 2 |
| 8.5 | $f(x) = -2 \times 3^{x+2} + 1$ ✓ $y = -2 \cdot 3^x + 1$ ✓ $y = -2 \cdot 3^{x+2} + 1$ ✓ | ✓ $x + 2$ ✓ $-2 \times 3^{x+2} + 1$ (2) | 2 |
| | | [9] | |

QUESTION 9/VRAAG 9

| | | | |
|-----|--|---|---|
| 9.1 | $3y = x - 5$ Let/stel $y = 0$ $0 = x - 5$ ✓ $x = 5$ $(5; 0)$ ✓ | Do not penalise if not in coordinate form. Mo nie penaliseer indien nie in koördinaatvorm nie. ✓ $y = 0$ ✓ answer/antwoord (2) | 2 |
| 9.2 | $f(x) = a(x+2)(x-5)$ ✓ $(-1; 3)$ Sub $3 = a(-1+2)(-1-5)$ ✓ $3 = a(1)(-6)$ $3 = -6a$ $a = \frac{1}{-2}$ ✓ NOTE/LET WEL: No reference can be made to 9.3/Geen verwysing kan na 9.3 gemaak word nie. $f(x) = \frac{1}{-2}(x+2)(x-5)$ $f(x) = \frac{1}{-2}(x^2 - 3x - 10)$ $f(x) = \frac{1}{-2}x^2 + \frac{3}{2}x + 5$ ✓ | ✓ setting up equation/ opstel van vergelyking ✓ substitution/substitusie $(-1; 3)$ ✓ a-value/waarde ✓ simplification/vereenvoudiging (4) | 4 |

| | | |
|------|--|---|
| 9.3 | $x = \frac{-2+5}{2} = \frac{3}{2}$ OR/OF $x = \frac{-b}{2a} = \frac{-3}{2(\frac{-1}{2})} = \frac{3}{2}$ $f(\frac{3}{2}) = \frac{-1}{2}(\frac{3}{2})^2 + \frac{3}{2}(\frac{3}{2}) + 5$ $= 6\frac{1}{8}$ or/of $\frac{49}{8}$ or/of 6,125 $(\frac{3}{2}; 6\frac{1}{8})$ | $\checkmark x = \frac{3}{2}$ $\checkmark y = 6\frac{1}{8}$ |
| | | (2) |
| 9.4 | $E: 3y = x - 5$ Let/stel $x = -1$ $\therefore 3y = -1 - 5$ $3y = -6$ $y = -2$ $E(-1; -2)$ $DE = 5$ units/eenhede | $D(-1; 3)$ $E(-1; -2)$ $DE = y_D - y_E$ $= 3 - (-2)$ $= 5$ \checkmark substitute/vervang $x = -1$ $\checkmark y = -2$ \checkmark answer/antwoord |
| | | (3) |
| 9.5 | $D(-1; 3); B(5; 0)$ $m = \frac{3-0}{-1-5} = \frac{3}{-6} = \frac{1}{-2}$ | \checkmark answer/antwoord |
| | | (1) |
| 9.6 | $x \leq -2$ or/of $0 \leq x \leq 5$ | $\checkmark x \leq -2$ $\checkmark 0 \leq x \leq 5$ |
| | | (2) |
| [14] | | |

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QUESTION 10/VRAAG 10

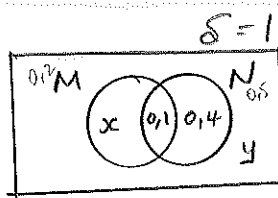
| | | |
|------|---|---|
| 10.1 | $a = 9$ $b = 13$ $c = 9$ $e = 17 - d$ $f = 23 - d$ $23 - d + d + 17 - d + 8 + 9 + 10 + 13 + 9 = 84$ $-d + 89 = 84$ $d = 5$ OR/OF $23 - d + d + 17 - d + 8 + 9 + 10 + 13 = 75$ $-d + 80 = 75$ $d = 5$ $e = 12$ $f = 18$ | $\checkmark a = 9$ $\checkmark b = 13$ $\checkmark c = 9$ $CA: b = 22 - a$ \checkmark equation/vergelijking $CA: e = 26 - a - d$ $CA: f = 23 - d$ $\checkmark d = 5$ $\checkmark e = 12$ $\checkmark f = 18$ |
| | | (7) |
| 10.2 | $P(\text{at least 2 out of 3/ten minste 2 uit 3})$ $= \frac{32}{84}$ or/of $\frac{8}{21}$ or/of 0,38 | $\checkmark 32$ \checkmark answer/antwoord |
| | | (2) |
| [9] | | |

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2

$$\frac{10 + 8 + d + a}{84} \quad CA$$

$$10 + 8 + 5 + 9$$



QUESTION 11/VRAAG 11

| | | |
|---------------|--|--|
| <p>11.1</p> | <p>For independent events/vir onafhanklike gebeurtenisse:</p> <p>$P(M \text{ and/} N) = P(M) \times P(N)$ ✓ $0,1 = P(M) \times 0,5$ $P(M) = \frac{0,1}{0,5}$ $= 0,2$ ✓ $x = 0,1$ ✓ $y = 0,4$ ✓ $\rightarrow 1 - (x + 0,1 + 0,4)$</p> <p>$0,1 = (0,1+x)(0,1+0,4)$ ✓ $0,2 = 0,1+x$ ✓ $0,1 = x$ ✓</p> | <p>✓ rule/reël ✓ substitution/substitusie ✓ 0,2 ✓ x-value/waarde ✓ y-value/waarde</p> <p>(5)</p> |
| <p>11.2.1</p> | <p>$P(\text{female failing/vroulik druip}) = \frac{16}{100}$ ✓ ✓ ✓ $\frac{4}{25}$ ✓ ✓ ✓</p> | <p>$\frac{16}{100}$ ✓</p> <p>(2)</p> |
| <p>11.2.2</p> | <p>$P(\text{pass, given male/slag, gegee manlik}) = \frac{30}{37}$ ✓ ✓ ✓</p> | <p>$\frac{30}{37}$ ✓</p> <p>(2)</p> |
| <p>11.3</p> | <p>$P(M \text{ or } A) = P(M) + P(A) - P(M \text{ and } A)$ ✓ $P(W \text{ of } R) = P(W) + P(R) - P(W \text{ en } R)$ $= 0,4 + 0,6 - 0,3$ $= 0,7$ ✓</p> <p>$P(\text{fails both/druip albei}) = 0,3$ ✓</p> <p>OR/OF</p> <p>$P(\text{fails both/druip albei}) = 0,3$ ✓</p> | <p>✓ rule/reël ✓ 0,7 ✓ answer/antwoord</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Answer ONLY: 1 mark. SLEGS antwoord: 1 punt.</p> </div> <p>✓ 0,1 ✓ 0,3</p> <p>✓ answer/antwoord</p> <p>(3)</p> |
| <p>[12]</p> | | <p>TOTAL/TOTAAL: 150</p> |

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3