education

Department:
Education
PROVINCE OF KWAZULU-NATAL

**FINAL & CLOSED MARKING GUIDELINES**

# MATHEMATICS P1

## COMMON EXAM

## NOVEMBER 2025

## MARKING GUIDELINES

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**NATIONAL SENIOR CERTIFICATE**

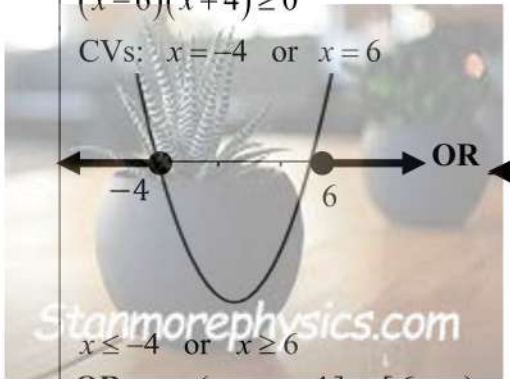
**GRADE 11**

**MARKS: 150**

**These marking guidelines consist of 19 pages.**

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**QUESTION 1**

| | | |
|---|---|---|
| 1.1.1 | $4x^2-9=0$<br>$(2x+3)(2x-3)=0$<br>$x=-\frac{3}{2}$ or $x=\frac{3}{2}$<br>**OR**<br>$4x^2-9=0$<br>$\sqrt{x^2}=\pm\sqrt{\frac{9}{4}}$<br>$x=-\frac{3}{2}$ or $x=\frac{3}{2}$<br>**Accept subst. to quadratic formula** | ✓A correct factors<br>✓CA answer ✓CA answer<br>(3)<br>**OR**<br>✓A isolating $x^2$<br>✓CA answer ✓CA answer<br>(3) |
| 1.1.2 | $-2x^2+6x-3=0$<br>$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$<br>$x=\frac{-(6)\pm\sqrt{(6)^2-4(-2)(-3)}}{2(-2)}$ OR $x=\frac{-(-6)\pm\sqrt{(-6)^2-4(2)(3)}}{2(2)}$<br>$x=2,37$ or $x=0,63$<br>**Penalise 1 mark for incorrect rounding** | ✓A correct subst. into quadratic formula<br>✓CA answer ✓CA answer<br>(3) |
| 1.1.3 | $x-3=\frac{2x^2+x-6}{x+2}$<br>$(x-3)(x+2)=2x^2+x-6$<br>$x^2-x-6=2x^2+x-6$<br>$2x^2+2x=0$<br>$x(x+2)=0$<br>$x=0$ or $x\neq-2$ | ✓A multiplication<br>✓CA standard form<br>✓CA answer ✓A rejection<br>(4) |
| 1.1.4 | $(x-5)(x+3)\geq 9$<br>$x^2-2x-15-9\geq 0$<br>$x^2-2x-24\geq 0$<br>$(x-6)(x+4)\geq 0$<br>CVs: $x=-4$ or $x=6$<br><br><br>$x\leq -4$ or $x\geq 6$<br>**OR** $x\in(-\infty;-4]\cup[6;\infty)$<br>**Final answer must be given 2 or 0.** | ✓A standard form<br>✓CA critical value<br>(**accept** if shown on a sketch)<br>✓✓CA both answers<br>(4) |

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|---|---|---|
| 1.2.1 | $\frac{1}{2^y}=4^{1-x}$<br>$2^{-y}=2^{2(1-x)}$<br>$2^{-y}=2^{2-2x}$<br>$-y=2-2x$<br>$\therefore y=2x-2$<br>**1.2.1 is a proof, all marks are accuracy.** | ✓A $2^{-y}=2^{2(1-x)}$<br>✓A $-y=2-2x$<br>(2) |
| 1.2.2 | $x+6=x^2-y$<br>$x+6=x^2-(2x-2)$<br>$x^2-3x-4=0$<br>$(x-4)(x+1)=0$<br>$x=4$ or $x=-1$<br>$y=2(4)-2$ or $y=2(-1)-2$<br>$y=6$ or $y=-4$<br>**OR**<br>$x+6=x^2-y$<br>$y=x^2-x-6$<br>$(2x-2)=x^2-x-6$<br>$x^2-3x-4=0$<br>$(x-4)(x+1)=0$<br>$x=4$ or $x=-1$<br>$y=2(4)-2$ or $y=2(-1)-2$<br>$y=6$ or $y=-4$ | ✓A substitution<br>✓CA factors<br>✓CA both values of $x$<br>✓CA both values of $y$<br>(4)<br>**OR**<br>✓A substitution<br>✓CA factors<br>✓CA both values of $x$<br>✓CA both values of $y$<br>(4) |
| 1.3 | $\Delta=2-(-2)=4$ & $\Delta=2-(-7)=9$<br>$k=-2$ or $k=-7$ | ✓A $k=-7$ ✓A $k=-2$<br>(2) |
| 1.4 | $2a=6$<br>$a=3$<br>$b^2-4ac=72$<br>$b^2-4(3)(b+18)=72$<br>$b^2-12b-216=72$<br>$b^2-12b-288=0$<br>$(b-24)(b+12)=0$<br>$b\neq 24$ or $b=-12$<br>$c=-12+18$<br>$c=6$ | ✓A value of $a$<br>✓CA subst. $a$ & $c$ into $\Delta=72$<br>✓CA standard form<br>✓CA value of $b$ with rejection<br>✓CA value of $c$<br>(5) |
| | | **[27]** |

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**QUESTION 2**

| | | |
|---|---|---|
| 2.1.1 | $2x.\left(27x^3\right)^{\frac{2}{3}}.\left(\frac{2x}{27x^3}\right)^0$<br>$=2x.\left(3^3x^3\right)^{\frac{2}{3}}\times 1$<br>$=2x.\left(3x\right)^{3\times\frac{2}{3}}$<br>$=2x\left(3x\right)^2$<br>$=2x\left(3^2x^2\right)$<br>$=18x^3$ | ✓A 1<br><br><br><br>✓A $3^2x^2$<br>✓CA answer<br>(3) |
| 2.1.2 | $\frac{\left(6-2\sqrt{3}\right)^2}{\sqrt{3}}$<br>$=\frac{36-24\sqrt{3}+12}{\sqrt{3}}$<br>$=\frac{48-24\sqrt{3}}{\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}}$<br>$=\frac{48\sqrt{3}-24\times 3}{3}$<br>$=\frac{3\left(16\sqrt{3}-24\right)}{3}$<br>$=16\sqrt{3}-24$ | ✓A removing the brackets in numerator<br>✓A rationalising denom. i.e. $\times\frac{\sqrt{3}}{\sqrt{3}}$<br><br>✓CA simplifying the numerator<br><br>✓CA answer<br>(4) |
| 2.2.1 | $\frac{2^{m+4}-4.2^{m+1}}{5.2^{m+3}}$<br>$=\frac{2^m.2^4-4.2^m.2^1}{2^m.5.2^3}$ OR $=\frac{2^m.2^4-2^2.2^m.2^1}{2^m.5.2^3}$<br>$=\frac{2^m\left(2^4-4\times 2\right)}{2^m.5.8}$ OR $=\frac{2^m.2^3\left(2^1-1\right)}{2^m.2^3.5}$<br>$=\frac{8}{40}$ or $\frac{1}{5}$ or 0,2<br>**OR** | ✓A expansion using exponent law<br><br>✓A factorising the numerator<br><br>✓CA answer<br>(3)<br>**OR**<br><br>✓✓A factorising the numerator |

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|---|---|---|
| | $\frac{2^{m+4}-4.2^{m+1}}{5.2^{m+3}}$<br>$=\frac{2^m\left(2^4-4\times 2\right)}{2^m.5.8}$ OR $=\frac{2^m.2^3\left(2^1-1\right)}{2^m.2^3.5}$<br>$=\frac{8}{40}$ or $\frac{1}{5}$ or $0,2$<br>**OR**<br>$\frac{2^{m+4}-4.2^{m+1}}{5.2^{m+3}}$<br>$=\frac{2^m.16-8.2^m}{5.2^m.8}$<br>$=\frac{2^m.8}{5.2^m.8}$<br>$=\frac{8}{40}$ or $\frac{1}{5}$ or $0,2$<br>**OR**<br>$\frac{2^{m+4}-4.2^{m+1}}{5.2^{m+3}}$<br>$=\frac{2^{m+4}}{2^m.5.8}-\frac{4.2^{m+1}}{2^m.5.8}$<br>$=\frac{2^{m+4-m}}{40}-\frac{4.2^{m+1-m}}{40}$<br>$=\frac{16}{40}-\frac{8}{40}$<br>$=\frac{8}{40}$ or $\frac{1}{5}$ or $0,2$ | ✓CA answer<br>**OR**<br>✓A simplifying terms in numerator<br>✓A adding like terms in numerator<br>✓CA answer<br>**OR**<br>✓A splitting to two fractions<br>✓A simplification<br>✓CA answer<br>(3) |
| 2.2.2 | $5=\frac{1}{125^x}$<br>$5=\frac{1}{5^{3x}}$<br>$5.5^{3x}=1$<br>$5^{1+3x}=5^0$<br>$1+3x=0$<br>$x=-\frac{1}{3}$<br>**OR** | ✓A equating $\frac{1}{125^x}$ to 5<br>✓A $5^{1+3x}=5^0$<br>✓CA answer<br>(3)<br>**OR**<br>✓A equating $\frac{1}{125^x}$ to 5 |

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|---|---|---|
| | $5=\frac{1}{125^{x}}$<br>$5=\frac{1}{5^{3x}}$<br>$5=5^{-3x}$<br>$1=-3x$<br>$x=-\frac{1}{3}$ | ✓A $5=5^{-3x}$<br>✓CA answer<br>(3) |
| 2.3 | $\sqrt{x^2-53}-2\sqrt{2x-5}=0$<br>$\sqrt{x^2-53}=2\sqrt{2x-5}$<br>$\left(\sqrt{x^2-53}\right)^2=\left(2\sqrt{2x-5}\right)^2$<br>$x^2-53=4(2x-5)$<br>$x^2-53=8x-20$<br>$x^2-8x-33=0$<br>$(x-11)(x+3)=0$<br>$x=11$ or $x\neq -3$ | ✓A isolating surds<br>✓A squaring on both sides<br>✓CA standard form<br>✓CA answers with selection.<br>(4) |
| | | **[17]** |

**QUESTION 3**

| | | |
|---|---|---|
| 3.1. | 14 | ✓A answer<br>(1) |
| 3.2 | 2 ; 6 ; 10 ; 14<br>$T_n=4n-2$ | ✓A $4n$ ✓A $-2$<br>(2) |
| 3.3 | $T_{10}=4(10)-2$ or $T_5=\left[2(10)-1\right]\times 2$<br>$T_{10}=38$<br>**Answer only full marks** | ✓CA subst. of $n=10$<br>✓CA answer<br>(2) |
| 3.4 | $T_n=4n-2$<br>$710=4n-2$<br>$4n=712$<br>$n=178$<br>**Answer only full marks OR If $n$ is a decimal, it must be rounded to whole number**<br>**OR** | ✓CA $T_n=710$<br>✓CA answer<br>(2)<br>**OR**<br>✓CA $T_n=355$ |

| | | |
|---|---|---|
| | $2n-1=355$<br>$2n=356$<br>$n=178$<br>**Answer only full marks OR If $n$ is a decimal, it must be rounded to whole number** | ✓CA answer<br>(2) |
| 3.5 | 2 ; 6 ; 14 ; 26.....hearts qu<br>4 ; 8 ; 12.....first difference<br>4 ; 4 .....second difference<br>$2a=4$ $3(2)+b=4$ $2-2+c=2$<br>$a=2$ $b=-2$ $c=2$<br>$T_n=2n^2-2n+2$<br>$266=2n^2-2n+2$<br>$2n^2-2n+2-266=0$<br>$n^2-n-132=0$<br>$(n-12)(n+11)=0$<br>$n=12$ or $n\neq-11$<br>Only the 12th message.<br>***n* must be a positive whole number**<br><br>**OR**<br>1 ; 3 ; 7 ; 13.....faces quad seq<br>2 ; 4 ; 6.....first difference<br>2 ; 2 .....second difference<br>$2a=2$ $3(1)+b=4$ $1-1+c=1$<br>$a=1$ $b=-1$ $c=1$<br>$T_n=n^2-n+1$<br>$133=n^2-n+1$<br>$n^2-n+1-133=0$<br>$n^2-n-132=0$<br>$(n-12)(n+11)=0$<br>$n=12$ or $n\neq-11$<br>Only the 12th message<br>***n* must be a positive whole number** | ✓A 14 and 26 in NEW pattern<br>✓A ALL values of $a$ , $b$ & $c$<br>✓CA general term<br>✓CA $T_n=266$<br>✓CA factors<br>✓CA both answers with rejection<br>(6)<br>**OR**<br>✓A 7 and 13 in NEW pattern<br>✓A ALL values of $a$ , $b$ & $c$<br>✓CA general term<br>✓CA $T_n=133$<br>✓CA factors<br>✓CA both answers with rejection<br>(6) |
| | | **[13]** |

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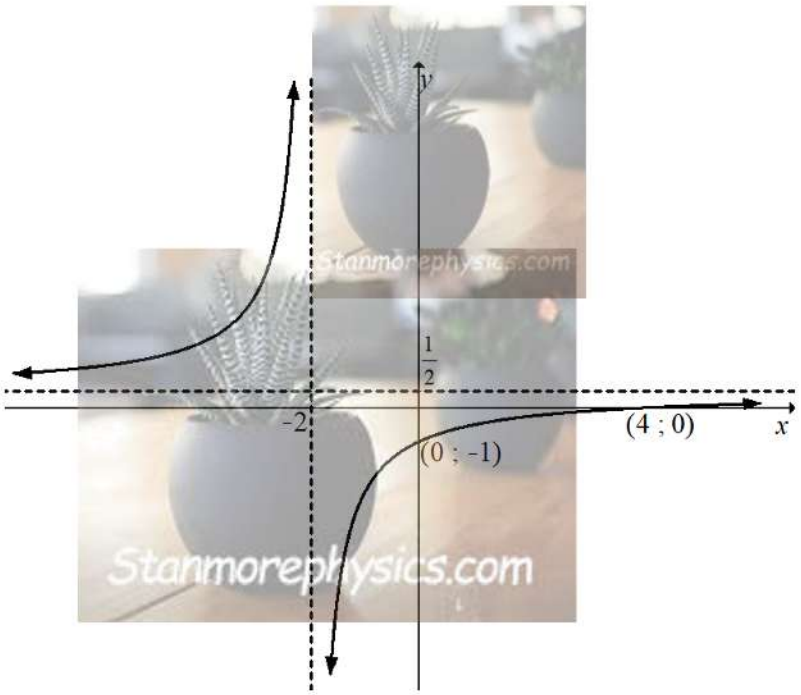
**QUESTION 4**

| | | |
|---|---|---|
| 4.1. | $-7$ ; $m$ ; $5$ ; $n$<br>$(m+7)$ ; $(5-m)$ ; $(n-5)$.....first difference<br>$-2m-2$ ; $m+n-10$ .....second difference<br>$\therefore -2m-2=4$ $\quad \therefore m+n-10=4$<br>$-2m=6$ $\quad -3+n-10=4$<br>$m=-3$ $\quad n=17$<br>**4.1 is a proof, all marks are accuracy.** | ✓A sec diff. in terms of $m$ and $n$<br>✓A $-2m=6$ ✓A $-3+n-10=4$<br>(3) |
| 4.2 | $4$ ; $8$ ; $12$ .....<br>$4n=292$<br>$n=73$<br>$\therefore T_{73}$ and $T_{74}$ in a quadratic sequence | ✓A $4n=292$<br>✓CA value of $n$<br>✓CA $T_{73}$ & $T_{74}$<br>(3) |
| 4.3 | $T_n=2n^2-2n-7$<br>$1005=2n^2-2n-7$<br>$2n^2-2n-1012=0$<br>$n^2-n-506=0$<br>$(n-23)(n+22)=0$<br>$n=23$ or $n\neq -22$<br>$T_{23}=1005$ | ✓A $T_n=1005$<br>✓A standard form<br>✓CA factors<br>✓CA both answers with rejection<br>(4) |
| | | **[10]** |

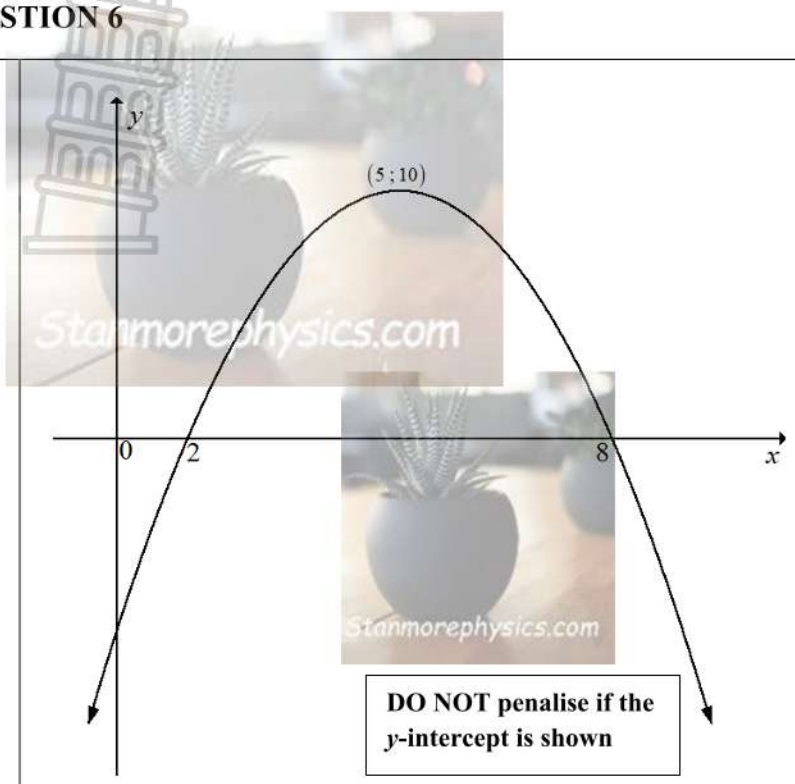
**QUESTION 5**

| | | |
|---|---|---|
| 5.1 | $f(x)=\frac{-3}{x+2}+\frac{1}{2}$<br>$f(0)=\frac{-3}{(0)+2}+\frac{1}{2}$<br>$y=-1$ | ✓A answer<br>(1) |
| 5.2 | $x=-2$<br>$y=\frac{1}{2}$ | ✓A answer<br>✓A answer<br>(2) |

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|---|---|---|
| 5.3 | $f(x)=\frac{-3}{x+2}+\frac{1}{2}$<br>$0=\frac{-3}{x+2}+\frac{1}{2}$<br>$\frac{1}{2}=\frac{-3}{x+2}$<br>$-x-2=-6$<br>$-x=-4$<br>$x=4$<br>**Answer only full marks, and ALL marks are accuracy since it is given** | ✓A let $y=0$<br>✓A answer<br>(2) |
| 5.4 |  | ✓A shape<br>✓CA both asymptotes<br>✓CA both intercepts<br>(3) |
| 5.5 | $y>\frac{1}{2}$ or $-1\le y\le 0$<br>**OR**<br>$y\in\left(-\infty;\frac{1}{2}\right)$ or $y\in[-1;0]$ | ✓✓A answer<br>(2)<br>**OR**<br>✓✓A answer<br>(2) |
| 5.6 | $p(x)=\frac{3}{x-2}+2$<br>**OR**<br>$p(x)=\frac{-3}{-x+2}+2$ | ✓A $\frac{3}{x-2}$ ✓A +2<br>(2)<br>**OR**<br>✓A $\frac{-3}{-x+2}$ ✓A +2<br>(2) |
| | | **[12]** |

**QUESTION 6**

| | | |
|---|---|---|
| 6.1 | <br>**DO NOT penalise if the *y*-intercept is shown** | ✓A T.P $(5\,;10)$<br>✓A both $x-$intercepts.<br>✓A shape<br>(3) |
| 6.2.1 | $-x^2+9=0$<br>$x^2-9=0$<br>$(x+3)(x-3)=0$<br>$x=-3$ or $x=3$<br>$A(-3\,;0)$<br>**Answer only full marks**<br>**OR**<br>$-x^2+9=0$<br>$x^2=9$<br>$x=\pm 3$<br>$x=-3$ or $x=3$<br>$A(-3\,;0)$<br>**Answer only full marks** | ✓A let $y=0$<br>✓A correct factors<br>✓CA answer<br>(3)<br>**OR**<br>✓A let $y=0$<br>✓A isolating the square<br>✓CA answer<br>(3) |

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| 6.2.2 | Other $x$ – intercept in $h$ is $(9\ \ 0)$<br>$y = a(x - x_1)(x - x_2)$<br>$y = a(x+3)(x-9)$<br>$-\frac{27}{4} = a(0+3)(0-9)$ OR $-9 = a(3+3)(3-9)$<br>$-\frac{27}{4} = a(-27)$ OR $-9 = -36a$<br>$a = \frac{1}{4}$<br>$\therefore y = \frac{1}{4}(x+3)(x-9)$<br>$\therefore y = \frac{1}{4}(x^2 - 6x - 27)$<br>$\therefore y = \frac{1}{4}x^2 - \frac{3}{2}x - \frac{27}{4}$<br>$a = \frac{1}{4}$ and $b = -\frac{3}{2}$<br>**OR**<br>$C(3\ ;\ -9)$<br>$y = a(x+p)^2 + q$<br>$y = a(x-3)^2 - 9$<br>$0 = a(-3-3)^2 - 9$ OR $-\frac{27}{4} = a(0-3)^2 - 9$<br>$9 = a(36)$ OR $\frac{9}{4} = 9a$<br>$a = \frac{1}{4}$<br>$y = \frac{1}{4}(x-3)^2 - 9$<br>$y = \frac{1}{4}(x^2 - 6x + 9) - 9$<br>$y = \frac{1}{4}x^2 - \frac{3}{2}x - \frac{27}{4}$<br>$\therefore a = \frac{1}{4}$ and $b = -\frac{3}{2}$ | **Since 6.2.2 is a proof, all marks are accuracy.**<br><br>**Since 6.2.2 is a proof, all marks are accuracy.** | ✓A identifying $(9\ ;0)$<br>✓A substitution of $x$ – intercepts<br>✓A subst.of $\left(0\ ;-\frac{27}{4}\right)$ or $(3\ ;-9)$<br>✓A simplification of $h$.<br>(4)<br>**OR**<br>✓A identifying $C(3\ ;-9)$<br>✓A substitution of $C(3\ ;-9)$<br>✓A subst. $\left(0\ ;-\frac{27}{4}\right)$ or $(-3\ ;0)$<br>✓A simplification to $h$.<br>(4) |
| 6.2.3 | $C(3\ ;-9)$<br>$y \in \mathbb{R} : y \geq -9$<br>**OR**<br>$C(3\ ;-9)$<br>$y \in [-9\ ;\infty)$ | **Answer only full marks**<br><br>**Answer only full marks** | ✓A $y_C = -9$<br>✓A answer<br>**OR**<br>✓A $y_C = -9$<br>✓A answer<br>(2) |

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|---|---|---|---|
| 6.2.4 | Reflection about $x-$axis, and shift of 5 units up<br>**OR**<br>shift of 5 units down , and reflection about the $x-$axis | **Must be in this order**<br>**Must be in this order** | ✓A reflection about the $x-$axis<br>✓A 5 units up<br>(2)<br>**OR**<br>✓A 5 units down<br>✓A reflection about the $x-$axis<br>(2) |
| 6.2.5 | $\frac{1}{4}x^2-\frac{3}{2}x-\frac{27}{4}=-x^2+9$<br>$\frac{5}{4}x^2-\frac{3}{2}x-\frac{63}{4}=0$<br>$5x^2-6x-63=0$<br>$(x+3)(5x-21)=0$<br>$x=-3$ or $x=\frac{21}{5}=4,2$<br>$y=0$ or $y=-\frac{216}{25}=-8,64$<br>$D(4,2\ ;\ -8,64)$ | | ✓A equating both equations<br>✓CA standard form<br>✓CA correct factors<br>✓CA value of $x$ ✓CA value of $y$<br>(5) |
| 6.2.6 | $h(-1)=-5$ & $h(7)=-5$<br>$\therefore k=-5$ | **Answer only full marks** | ✓A $x-$value of $-1$ or $7$<br>✓A answer<br>(2) |
| | | | **[21]** |

**QUESTION 7**

| | | | |
|---|---|---|---|
| 7.1 | $h(x)=2^x+q$<br>$-7\frac{3}{4}=2^{-2}+q$<br>$q=-8$ | | ✓A substituting $\left(-2\ ;\ -7\frac{3}{4}\right)$<br>✓A answer<br>(2) |
| 7.2 | $2^x-8=0$<br>$2^x=2^3$<br>$x=3$<br>$A(3\ ;\ 0)$ | **Answer only full marks** | ✓A let $y=0$<br>✓A $2^x=2^3$<br>✓A answer<br>(3) |

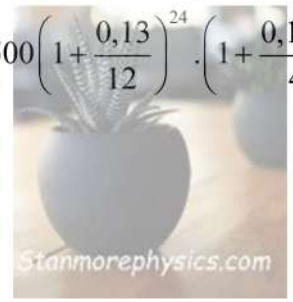
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|---|---|---|
| 7.3 | $f(0)=2^0-8$<br>$f(0)=-7$<br>$B(0;-7)$<br>$m=\frac{y_2-y_1}{x_2-x_1}$<br>$m=\frac{0-(-7)}{3-0}$<br>$m=\frac{7}{3}$ | ✓A coordinate of B<br>✓CA substitution<br>✓CA answer<br>(3) |
| 7.4 | $0 \le x < 3$<br>**OR**<br>$x \in [0;3)$ | ✓✓AA answer<br>(2)<br>**OR**<br>✓✓AA answer<br>(2) |
| 7.5 | $7 < k < 8$<br>**OR**<br>$k \in (7;8)$ | ✓✓CACA answer<br>(2)<br>**OR**<br>✓✓CACA answer<br>(2) |
| | | **[12]** |

**QUESTION 8**

| | | |
|---|---|---|
| 8.1. | $A=P(1+i.n)$<br>$A=R\,15000(1+0,10\times 6)$<br>$A=R\,24000$<br>Interest = R24000 – R15000<br>=R 9000<br>**OR**<br>Interest $=p\times i\times n$<br>$=15000\times 0,1\times 6$<br>= R 9000 | ✓A subst. into correct formula<br>✓A value of A<br>✓CA answer<br>(3)<br>**OR**<br>✓A correct formula<br>✓A subst. into correct formula<br>✓CA answer<br>(3) |
| 8.2 | $A=P(1-i)^n$<br>$R277\,216=P(1-0,0825)^3$<br>$\frac{455625}{(1-0,0825)^3}=P$<br>$\therefore$ P = R358 922 | ✓A subst. to correct formula<br>✓CA answer<br>(2) |

| | | |
|---|---|---|
| 8.3 | $1+i_{eff}=\left(1+\frac{i_{nom}}{m}\right)^{m}$<br>$1+0,12=\left(1+\frac{i_{nom}}{4}\right)^{4}$<br>$i_{nom}=4.\left(\sqrt[4]{1,12}-1\right)\times 100\%$<br>$r=11,49\%$ | ✓A correct formula<br>✓A subst into correct formula<br>✓CA simplification<br>✓CA answer<br>(4) |
| 8.4 | $A=P(1+i)^{n}$<br>$A=R250000\left(1+\frac{0,0925}{2}\right)^{19}$<br>$A=R59022$ | ✓A $\frac{0,0925}{2}$ ✓ $n=19$<br>✓CA answer<br>(3) |
| 8.5 | $6500\left(1+\frac{0,13}{12}\right)^{12\times 2}\left(1+\frac{0,105}{4}\right)^{4\times 3}-x\left(1+\frac{0,105}{4}\right)^{4\times 2}=7428,30$<br>$x=\frac{6500\left(1+\frac{0,13}{12}\right)^{24}\left(1+\frac{0,105}{4}\right)^{12}-7428,30}{\left(1+\frac{0,105}{4}\right)^{8}}$<br>$x=R3300$<br>**OR**<br>$\left[6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4}-x\right]\left(1+\frac{0,105}{4}\right)^{8}=7428,30$<br>$-x=\frac{7428,30}{\left(1+\frac{0,105}{4}\right)^{8}}-6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4}$<br>$-x=-R3300$<br>$\therefore x=R3300$<br>**OR** | ✓A $6500\left(1+\frac{0,13}{12}\right)^{24}$<br>✓A $\left(1+\frac{0,105}{4}\right)^{12}$<br>✓A $-x\left(1+\frac{0,105}{4}\right)^{8}$<br>✓A all equated to $7428,30$<br>✓CA answer<br>(5)<br>**OR**<br>✓A $6500\left(1+\frac{0,13}{12}\right)^{24}$<br>✓A $\left(1+\frac{0,105}{4}\right)^{4}-x$<br>✓A $\left(1+\frac{0,105}{4}\right)^{8}$<br>✓A ALL equated to $7428,30$<br>✓CA answer<br>(5)<br>**OR** |

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| | | |
|---|---|---|
| | $A_3 = 6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4} - x$.....forward equation<br>$P_3 = \frac{7428,30}{\left(1+\frac{0,105}{4}\right)^{8}}$.....reverse equation<br>$A_3 = P_3$<br>$6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4} - x = \frac{7428,30}{\left(1+\frac{0,105}{4}\right)^{8}}$<br>$-x = \frac{7428,30}{\left(1+\frac{0,105}{4}\right)^{8}} - 6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4}$<br>$-x = -\text{R } 3300$<br>$\therefore x = \text{R}3300$<br><br><br>**OR**<br>$A_3 = 6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4}$.....forward equation<br>$P_3 = \frac{7428,30}{\left(1+\frac{0,105}{4}\right)^{8}} + x$.....reverse equation<br>$A_3 = P_3$<br>$6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4} = \frac{7428,30}{\left(1+\frac{0,105}{4}\right)^{8}} + x$<br>$x = 6500\left(1+\frac{0,13}{12}\right)^{24}.\left(1+\frac{0,105}{4}\right)^{4} - \frac{7428,30}{\left(1+\frac{0,105}{4}\right)^{8}}$<br>$\therefore x = \text{R}3300$ | ✓A $6500\left(1+\frac{0,13}{12}\right)^{24}$<br>✓A $\left(1+\frac{0,105}{4}\right)^{4} - x$<br>✓A $\left(1+\frac{0,105}{4}\right)^{8}$<br>✓A ALL equated to 7428,30<br>✓ CA answer<br>(5)<br>**OR**<br>✓A $6500\left(1+\frac{0,13}{12}\right)^{24}$<br>✓A $\left(1+\frac{0,105}{4}\right)^{4} - x$<br>✓A $\left(1+\frac{0,105}{4}\right)^{8}$<br>✓A ALL equated to 7428,30<br>✓CA answer<br>(5) |
| | | **[17]** |

**QUESTION 9**

| | | |
|---|---|---|
| 9.1.1 | $P(A \text{ and } C) = 0$ | ✓A answer (1) |
| 9.1.2 | $P(A \text{ or } C) = P(A) + P(C) - P(A \text{ and } C)$<br>$P(A \text{ or } C) = 0,47 + \frac{3}{7} - 0$<br>$P(A \text{ or } C) = 0,90$<br>**OR**<br>$P(A \text{ or } C) = P(A) + P(C)$<br>$P(A \text{ or } C) = 0,47 + \frac{3}{7}$<br>$P(A \text{ or } C) = 0,90$ | ✓A substitution to a correct rule<br>✓A answer (2)<br>**OR**<br>✓A substitution to a correct rule<br>✓A answer (2) |
| 9.2.1 | $P(A \text{ and } B) = P(A) \times P(B)$<br>$P(A \text{ and } B) = \frac{2}{5}P(B) \times P(B)$<br>$P(A \text{ and } B) = \frac{2}{5}P(B)^2$ | ✓A $P(A \text{ and } B) = P(A) \times P(B)$<br>✓A answer (2) |
| 9.2.2 | $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$<br>$0,7 = \frac{2}{5}P(B) + P(B) - \frac{2}{5}P(B)^2$<br>$0,7 = \frac{7}{5}P(B) - \frac{2}{5}P(B)^2$<br>$\frac{2}{5}P(B)^2 - \frac{7}{5}P(B) + \frac{7}{10} = 0$ OR $4P(B)^2 - 14P(B) + 7 = 0$<br>$P(B) = \frac{-\left(-\frac{7}{5}\right) \pm \sqrt{\left(-\frac{7}{5}\right)^2 - 4\left(\frac{2}{5}\right)\left(\frac{7}{10}\right)}}{2\left(\frac{2}{5}\right)}$<br>$P(B) = \frac{-(-14) \pm \sqrt{(-14)^2 - 4(4)(7)}}{2(4)}$<br>$P(B) = 0,60$ or $P(B) \neq 2,90$<br>**OR**<br>**If answer is CA,** $0 < P(B) < 1$ | ✓CA substitution to correct rule<br>✓CA equation in terms $P(B)$<br>✓CA substitution into quadratic formula<br>✓CA answer (5)<br>**OR**<br>< |

| | | |
|---|---|---|
| | $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$<br>$0,7 = P(A) + \frac{5}{2}P(A) - P(A).\frac{5}{2}P(A)$<br>$0,7 = \frac{7}{2}P(A) - \frac{5}{2}P(A)^2$<br>$\frac{5}{2}P(A)^2 - \frac{7}{2}P(A) + \frac{7}{10} = 0 \quad \text{OR} \quad 25P(A)^2 - 35P(A) + 7 = 0$<br>$P(A) = \frac{-\left(-\frac{7}{2}\right) \pm \sqrt{\left(-\frac{7}{2}\right)^2 - 4\left(\frac{5}{2}\right)\left(\frac{7}{10}\right)}}{2\left(\frac{5}{2}\right)}$<br>$P(A) = \frac{-(-35) \pm \sqrt{(-35)^2 - 4(25)(7)}}{2(25)}$<br>$P(A) = 0,24 \quad \text{or} \quad P(A) \neq 1,16$<br>$P(A) = \frac{2}{5}P(B)$<br>$0,24 = \frac{2}{5}P(B)$<br>$\therefore P(B) = 0,60 \quad \text{or} \quad \frac{3}{5}$<br>**If answer is CA,** $0 < P(B) < 1$ | ✓CA substitution to correct rule<br>✓CA equation in terms of P(A)<br>✓CA substitution into quadratic formula<br>✓CA P(A)<br>✓CA answer<br>(5) |
| | | **[10]** |

**QUESTION 10**

| | | |
|---|---|---|
| 10.1.1 | Let the number of females who will love to buy Gucci be $x$<br>$y + 2x = 45$.....line 1<br>$x + 3y = 85$.....line 2<br>$y = 45 - 2x$..... OR $x = 85 - 3y$<br>$x + 3(45 - 2x) = 85$ OR $y + 2(85 - 3y) = 45$<br>$x + 135 - 6x = 85$ OR $y + 170 - 6y = 45$<br>$-5x = -50$ OR $-5y = -125$<br>$x = 10$ $y = 25$<br>$x = 10$<br>**$x$ must be a positive whole number** | ✓A males : $y + 2x = 45$<br>✓A females : $x + 3y = 85$<br>✓A $y = 45 - 2x$ OR $x = 85 - 3y$<br>✓CA substitution<br>✓CA simplification<br>✓CA answer<br>(6) |

**OR**

| | Gucci | Louis Vuitton | |
|---|---|---|---|
| Males | $y$ | $45-y$ | 45 |
| Females | $85-3y$ | $3y$ | 85 |
| | $85-2y$ | $45+2y$ | 130 |

**OR**

✓A M and LV $= 45-y$
✓A F and Gucci $= 85-3y$

$45-y=2(85-3y)$
$45-y=170-6y$
$5y=125$
$y=25$
$x=10$ females who would love Gucci items

✓A✓A $45-y=2(85-3y)$

✓CA values of $y$
✓CA answer

(6)

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**OR**

Allow $n$ to represent total number
$n(M)=85 \quad \& \quad n(F)=45$
$n(M \text{ and } G)=y$
$n(M \text{ and } LV)=2(85-3y)=170-6y$
$n(F \text{ and } G)=85-3y$
$n(F \text{ and } LV)=3y$
$\therefore 2(85-3y)+y=45$
$170-6y+y=45$
$-5y=-125$
$y=25$
$x=10$ females who would love Gucci items

**OR**

✓A $2(85-3y)$ or $170-6y$
✓A $85-3y$

✓A✓A $2(85-3y)+y=45$

✓CA value of $y$
✓CA answer.

(6)

10.2

$$P(\text{M and G}) = \frac{25}{130} = 0,19$$

$$P(\text{M}) \times P(\text{G}) = \frac{45}{130} \times \frac{35}{130} = \frac{63}{675} = 0,09$$

$P(\text{M and G}) \neq P(\text{M}) \times P(\text{G})$

Both events are NOT independent

✓CA $\frac{25}{130}$ or $\frac{5}{26}$ or 0,19

✓CA $\frac{45}{130} \times \frac{35}{130}$

✓CA $\frac{63}{675}$ or $\frac{7}{75}$ or 0,09

✓CA NOT independent

(4)

| | | |
|---|---|---|
| | **OR**<br>$P(\text{M and LV}) = \frac{20}{130}$<br>$= 0,15$<br>$P(\text{M}) \times P(\text{LV}) = \frac{45}{130} \times \frac{95}{130}$<br>$= \frac{171}{676}$<br>$= 0,25$<br>$P(\text{M and LV}) \neq P(\text{M}) \times P(\text{LV})$<br>Both events are NOT independent | **OR**<br>✓CA $\frac{20}{130}$ or $\frac{2}{13}$ or 0,19<br>✓ CA $\frac{45}{130} \times \frac{95}{130}$<br>✓ CA $\frac{171}{676}$ or $0,25$<br>✓CA NOT independent<br>(4) |
| | | **[10]** |

**TOTAL: 150**

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