



## **KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

### **NATIONAL SENIOR CERTIFICATE**

**GRADE 11**

**MATHEMATICS P1**

**NOVEMBER 2025**

[Stanmorephysics.com](http://Stanmorephysics.com)

[Stanmorephysics.com](http://Stanmorephysics.com)

**MARKS: 150**

**TIME: 3 hours**

**This question paper consists of 9 pages and 1 information sheet.**

**INSTRUCTIONS AND INFORMATION**

Read the following instructions carefully before answering the questions.

1. This question paper consists of 10 questions.
2. Answer ALL the questions in the SPECIAL ANSWER BOOK provided.
3. Clearly show numbering if additional space has been used to answer some question. If NOT, cross out all rough work done in the additional space.
4. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
5. Answers only will NOT necessarily be awarded full marks.
6. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
7. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
8. Diagrams are NOT necessarily drawn to scale.
9. An information sheet with formulae is included at the end of the question paper.
10. Write neatly and legibly.

**QUESTION 1**1.1 Solve for  $x$ :


 1.1.1  $4x^2 - 9 = 0$  (3)

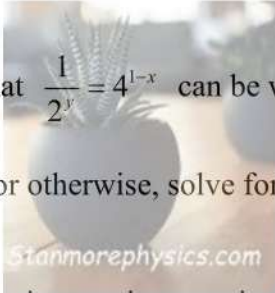
1.1.2  $-2x^2 + 6x - 3 = 0$  (answers correct to TWO decimal places) (3)

1.1.3  $x - 3 = \frac{2x^2 + x - 6}{x + 2}$  (4)

1.1.4  $x^2 - 2x - 15 \geq 9$  (4)

1.2 Two equations are given below:

$$\frac{1}{2^y} = 4^{1-x} \quad \text{and} \quad x + 6 = x^2 - y$$


 1.2.1 Show that  $\frac{1}{2^y} = 4^{1-x}$  can be written as  $y = 2x - 2$ . (2)

1.2.2 Hence, or otherwise, solve for both  $x$  and  $y$ . (4)

1.3 The roots of a quadratic equation are given as:  $x = \sqrt{2-k}$ , where  $k \in (-9:0)$ . Determine the integral values of  $k$  for which the roots are rational. (2)

1.4 The roots of the equation  $ax^2 + bx + c = 0$  are  $\frac{-b \pm \sqrt{72}}{6}$  where  $b < 0$  and  $c = b + 18$ . Calculate the values of  $a$ ,  $b$  and  $c$ . (5)  
[27]

**QUESTION 2**

2.1 Simplify fully, **WITHOUT** using a calculator:



2.1.1  $2x \cdot (27x^3)^{\frac{2}{3}} \cdot \left(\frac{2x}{27x^3}\right)^0$  (3)

2.1.2  $\frac{(6-2\sqrt{3})^2}{\sqrt{3}}$  (4)

2.2 It is given that  $\frac{2^{m+4} - 4 \cdot 2^{m+1}}{5 \cdot 2^{m+3}}$

2.2.1 Simplify the above expression. (3)

2.2.2 Hence, solve for  $x$  if  $\frac{5 \cdot 2^{m+3}}{2^{m+4} - 4 \cdot 2^{m+1}} = \frac{1}{125^x}$  (3)

2.3 Solve for  $x$ :  $\sqrt{x^2 - 53} - 2\sqrt{2x - 5} = 0$  (5)  
**[18]**

**QUESTION 3**

WhatsApp messages were sent using face emojis with two popping hearts per face (shown below).

MESSAGE 1	MESSAGE 2	MESSAGE 3

These faces and popping hearts in the different messages forms a linear number pattern.

3.1 How many popping hearts will appear in message 4? (1)

3.2 Determine the  $n^{th}$  term (general term) of the popping hearts in the messages. (2)

3.3 Calculate the number of popping hearts in the tenth ( $T_{10}$ ) message. (2)

3.4 In which message will there be 710 popping hearts? (2)

3.5 A new series of messages using the same emojis was created by:

- keeping the number of faces in message 1 and message 2 the same as the original messages.
- adding 2 more faces to the original message 3.
- adding 6 more faces to the original message 4.

The new series of messages forms a quadratic number pattern.  
 Which message in the NEW PATTERN will have 266 popping hearts? (6)

**[13]**

**QUESTION 4**

The first four terms of a quadratic number pattern are  $-7 ; m ; 5 ; n$ . The constant second difference is 4.

- 4.1 Prove, by calculations, that  $m = -3$  and  $n = 17$ . (3)
- 4.2 Which two consecutive terms of the quadratic number pattern has a first difference of 292? (3)
- 4.3 It is given that the general term of a quadratic number pattern is  $T_n = 2n^2 - 2n - 7$ . Calculate the value of  $n$  if  $T_n = 1\ 005$ . (4)
- [10]**

**QUESTION 5**

Consider the function  $f$  defined by  $f(x) = \frac{-3}{x+2} + \frac{1}{2}$ . Graph  $f$  passes through  $(4 ; 0)$ .

- 5.1 Write down the  $y$ -intercept of  $f$ . (1)
- 5.2 Write down the equations of the asymptotes of  $f$ . (2)
- 5.3 Calculate the  $x$ -intercept of  $f$ . (2)
- 5.4 Draw a neat sketch of  $f$ . Clearly label all the intercepts with the axes and asymptotes. (3)
- 5.5 Determine the values of  $y$  for which  $f$  lies  $x < -2$  or  $0 \leq x \leq 4$ . (2)
- 5.6 Graph  $f$  is reflected about the  $y$ -axis and shifted  $\frac{3}{2}$  units up to form  $p$ . Write down the equation of  $p$  in the form of  $p(x) = \dots$ . (2)
- [12]**

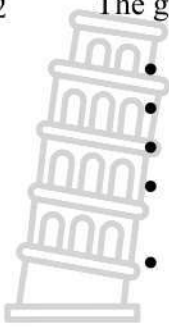
**QUESTION 6**

6.1 The function  $h(x) = ax^2 + bx + c$  has the following properties:

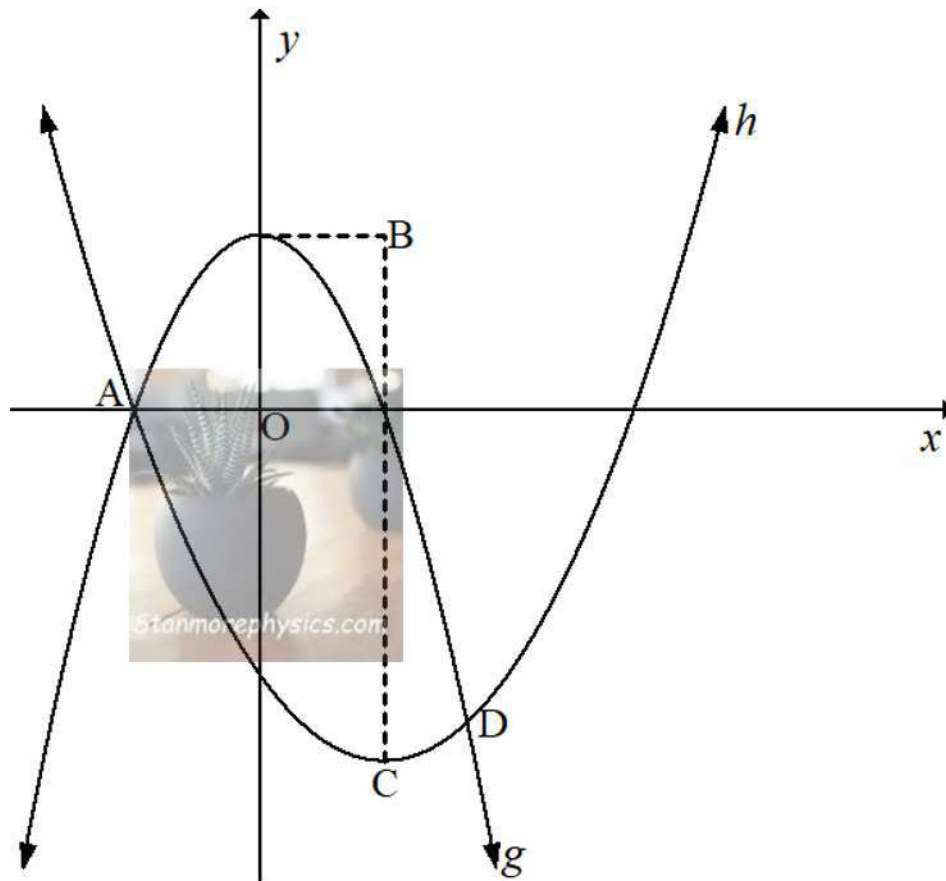
- $h(2) = 0$
- the value of  $\frac{-b}{2a}$  is 5
- the range of  $h$  is  $y \leq 10 ; y \in \mathbb{R}$ .

Draw a neat sketch of  $h$ . Clearly label the  $x$ -intercepts and turning point. (3)

6.2 The graphs of  $g(x) = -x^2 + 9$  and  $h(x) = ax^2 + bx - \frac{27}{4}$  are sketched below.



- A is an  $x$ -intercept of  $g$  and  $h$  and lies on the negative  $x$ -axis.
- A and D are the points of intersection of graphs  $g$  and  $h$ .
- C is the turning point of  $h$ .
- B lies on the horizontal line that passes through the turning point of  $g$  such that BC is parallel to the  $y$ -axis and passes through the other intercept of  $g$ .
- BC = 18 units

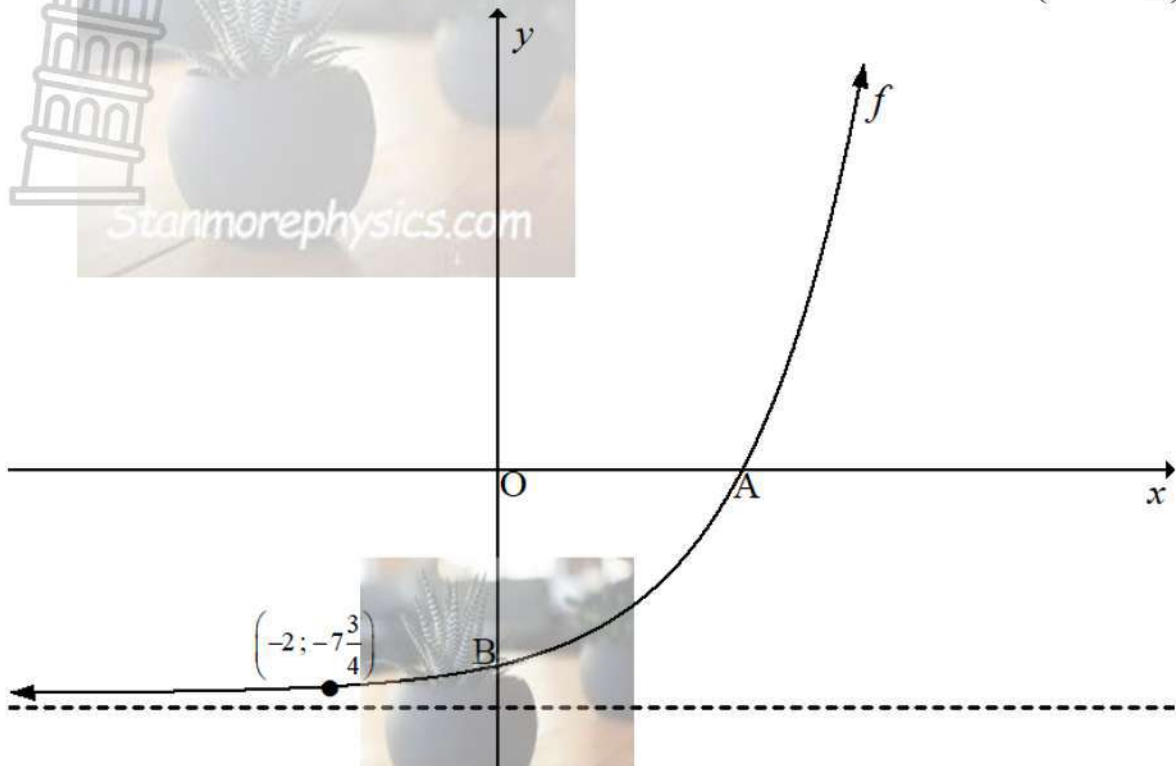


- 6.2.1 Calculate the coordinates of A. (3)
- 6.2.2 Show that  $a = \frac{1}{4}$  and  $b = -\frac{3}{2}$ . (4)
- 6.2.3 Write down the range of  $h$ . (2)
- 6.2.4 It is given that  $m(x) = x^2 - 4$ . Explain, in words, the transformation from the graphs of  $g$  to  $m$ . (2)
- 6.2.5 Calculate the coordinates of D. (5)
- 6.2.6 It is given that  $p(x) = k$ . Determine the integral value of  $k$  such that the distance between the points of intersection of  $h$  and  $p$  is 8 units. (2)

[21]

**QUESTION 7**

The graph of  $f(x) = 2^x + q$  is drawn below. . Graph  $f$  passes through the point  $\left(-2; -7\frac{3}{4}\right)$ .



- 7.1 Calculate the value of  $q$ . (2)
- 7.2 If  $q = -8$ , calculate the coordinates of A. (3)
- 7.3 Determine the average gradient between A and B. (3)
- 7.4 Determine the values of  $x$  where  $\frac{x}{f(x)} \leq 0$  (2)
- 7.5 Determine the values of  $k$  for which  $8 - 2^x - k = 0$  will have negative roots. (2)

**[12]**

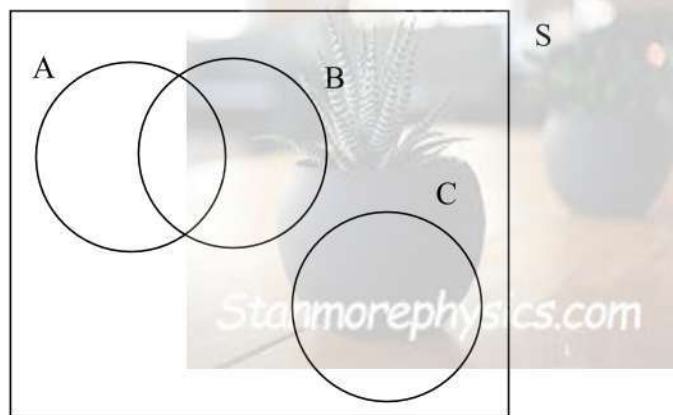
**QUESTION 8**

- 8.1 Dr Krishnanair invests R15 000 for a period of 6 years in an account that pays simple interest at the rate of 10% per annum. Calculate the interest his investment earned at the end of 6 years. (3)
- 8.2 Miss Coetzee bought a brand new car. The value of the car depreciates annually at the rate of 8,25% p.a. on the reducing balance method. If the book value of the car was R277 216 after 3 years, calculate the purchase price of the car. (2)
- 8.3 An advertisement reads “XY Bank offers loans at an effective interest rate of 12% per annum”. Calculate the nominal rate of interest if interest on the loan is compounded quarterly. (4)
- 8.4 Mr Dlezi invested R25 000 in an account that offers 9,25% per annum compounded half-yearly. Calculate the accumulated amount in this account at the end of nineteen half-years. (3)
- 8.5 Mr Masango invested R6 500 in a savings account that paid interest at the rate of 13% p.a., compounded monthly for the first two years. Thereafter, the interest rate changed to 10,5% p.a., compounded quarterly. Three years after making the initial deposit, Mr Masango withdrew R $x$  from the account. At the end of 5 years, he had R928,30 more in the account than his initial deposit. Calculate the value of  $x$ , to the nearest rand (5)

**[17]**

**QUESTION 9**

In the Venn diagram below, events A, B and C are shown.



9.1 It is given that  $P(A) = 0,47$  and  $P(C) = \frac{3}{7}$

9.1.1 Write down the  $P(A \text{ and } C)$ . (1)

9.1.2 Calculate the  $P(A \text{ or } C)$ . (2)

9.2 It is given that events A and B are independent and  $P(A) = \frac{2}{5}P(B)$ .

9.2.1 Determine the  $P(A \text{ and } B)$  in terms of  $P(B)$ . (2)

9.2.2 It also given that  $P(A \text{ or } B) = 70\%$ . Calculate  $P(B)$ . (5)

**[10]**

**QUESTION 10**

A survey was conducted amongst 45 males and 85 females who were randomly selected. This survey was about the brand of clothes they would love to buy between Gucci (G) and Louis Vuitton (LV). The results are summarised below.

- $3y$  females said they would love to buy Louis Vuitton.
- $y$  males said they would love to buy Gucci.
- The total number of males who said they would love to buy Louis Vuitton is double the total number of females who said they would love to buy Gucci.

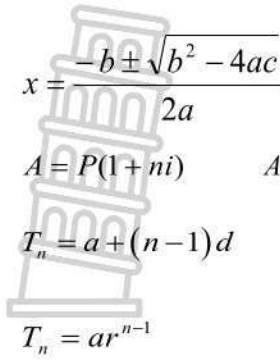
10.1 Calculate the total number of females who said they would love to buy Gucci. (6)

10.2 Are the events of being a 'male' and having said that they would love to buy one of the brands **independent**? Justify your answer with calculations. (4)

**[10]**

**TOTAL MARKS: 150**

**INFORMATION SHEET**



$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$A = P(1 + ni)$$

$$A = P(1 - ni)$$

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

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

$$T_n = a + (n - 1)d$$

$$S_n = \frac{n}{2} [2a + (n - 1)d]$$

$$S_n = \frac{a(r^n - 1)}{r - 1}; r \neq 1$$

$$S_\infty = \frac{a}{1 - r}; -1 < r < 1$$

$$T_n = ar^{n-1}$$

$$P = \frac{x[1 - (1 + i)^{-n}]}{i}$$

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$$

$$y = mx + c$$

$$y - y_1 = m(x - x_1)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \tan \theta$$

$$(x - a)^2 + (y - b)^2 = r^2$$

In  $\Delta ABC$ :  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$$a^2 = b^2 + c^2 - 2bc \cdot \cos A$$

$$\text{area } \Delta ABC = \frac{1}{2} ab \cdot \sin C$$

$$\sin(\alpha + \beta) = \sin \alpha \cdot \cos \beta + \cos \alpha \cdot \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cdot \cos \beta - \cos \alpha \cdot \sin \beta$$

$$\cos(\alpha + \beta) = \cos \alpha \cdot \cos \beta - \sin \alpha \cdot \sin \beta$$

$$\cos(\alpha - \beta) = \cos \alpha \cdot \cos \beta + \sin \alpha \cdot \sin \beta$$

$$\cos 2\alpha = \begin{cases} \cos^2 \alpha - \sin^2 \alpha \\ 1 - 2\sin^2 \alpha \\ 2\cos^2 \alpha - 1 \end{cases}$$

$$\sin 2\alpha = 2 \sin \alpha \cdot \cos \alpha$$

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$$

$$\sigma^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}$$

$$P(A) = \frac{n(A)}{n(S)}$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$\hat{y} = a + bx$$

$$b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$

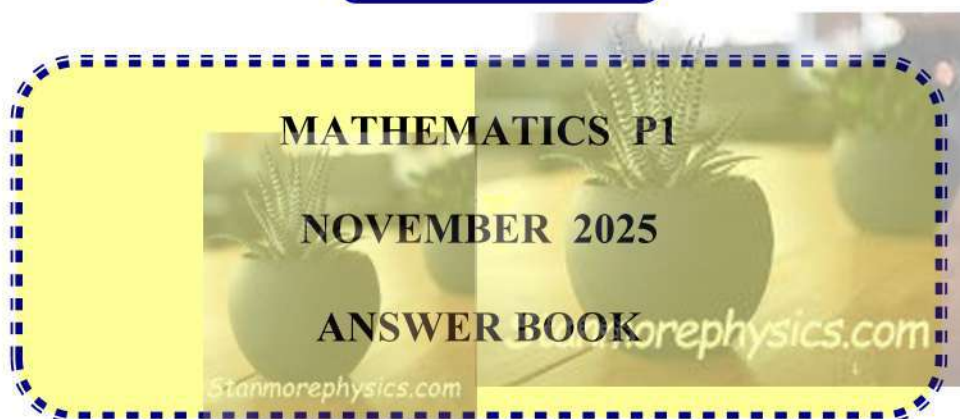


## KWAZULU-NATAL PROVINCE

EDUCATION  
REPUBLIC OF SOUTH AFRICA

### NATIONAL SENIOR CERTIFICATE

GRADE 11



Full Name & Surname	
---------------------	--



For Educator / Moderator Use Only ( NOT for learners to complete)										
QUESTION	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Total Per Question	27	18	13	10	12	21	12	17	10	10
Mark Scored										
Moderated Mark										

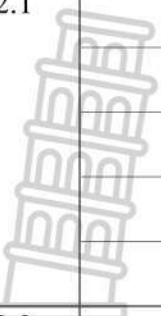


GRAND TOTAL

150

This answer book consists of 18 pages.

**QUESTION 1**

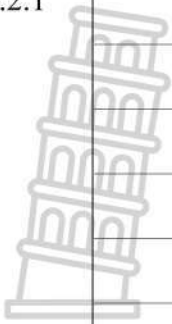
	<b>Solution</b>	<b>Marks</b>
1.1.1		(3)
1.1.2		(3)
1.1.3	 stanmorephysics.com	(4)
1.1.4		(4)

1.2.1		(2)
1.2.2		(4)
1.3		(2)
1.4		(5)
		<b>[27]</b>

**QUESTION 2**

	<b>Solution</b>	<b>Marks</b>
2.1.1		(3)
2.1.2		

2.2.1



(3)

2.2.2





(3)

2.3

(5)

[18]

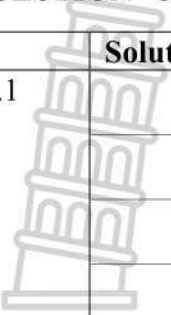

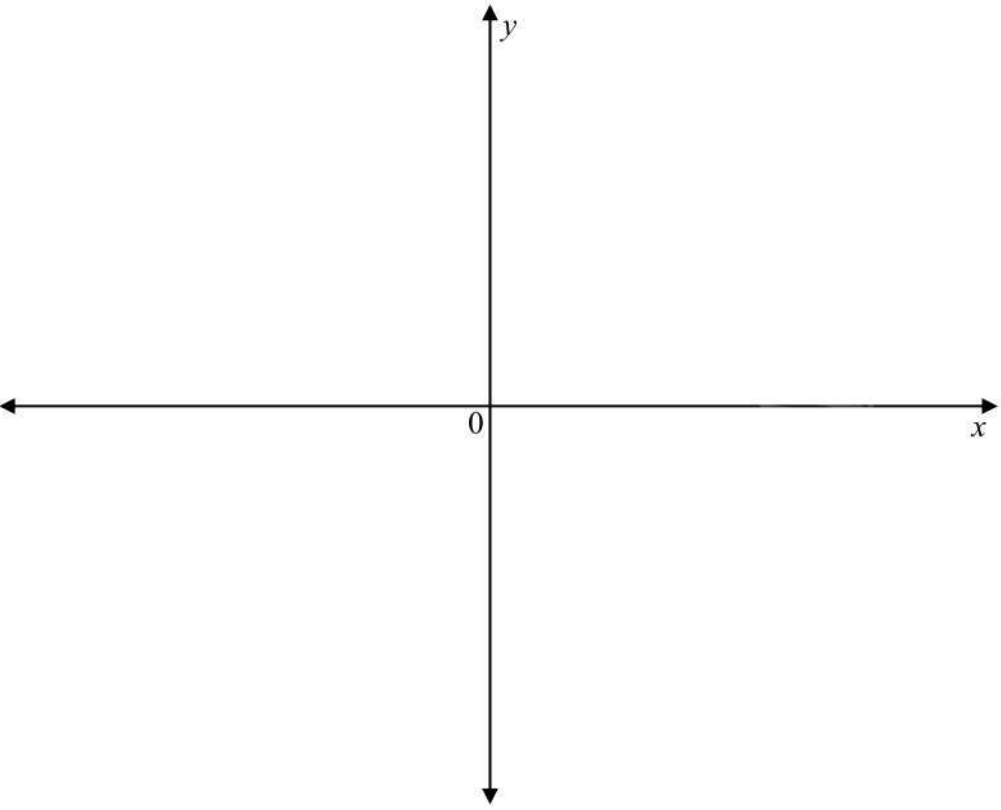
**QUESTION 3**

	Solution	Marks
3.1		
		(1)
3.2		
		(2)
3.3		
		(2)
3.4		
		(2)
3.5		
		(6)
		<b>[13]</b>

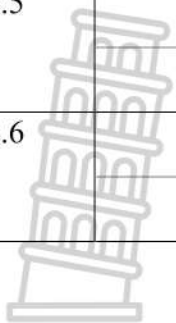
**QUESTION 4**

	<b>Solution</b>	<b>Marks</b>
4.1		(3)
4.2		(3)
4.3		(4)
		<b>[10]</b>

**QUESTION 5**

	<b>Solution</b>	<b>Marks</b>
5.1		(1)
5.2		(2)
5.3	 Stanmorephysics.com	(2)
5.4		(3)

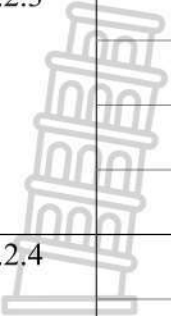

5.5		(2)
5.6		
		[12]



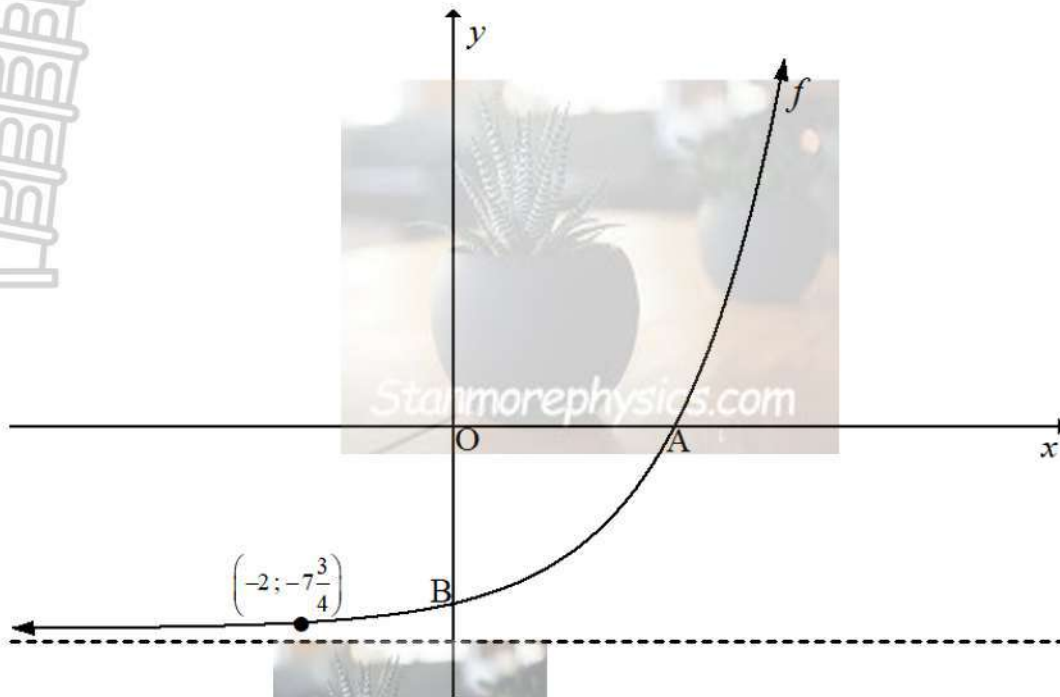
**QUESTION 6**

	Solution	Marks
6.1		(3)



6.2.3		(2)
6.2.4		(2)
6.2.5		(5)
6.2.6		(2)
		<b>[21]</b>

**QUESTION 7**

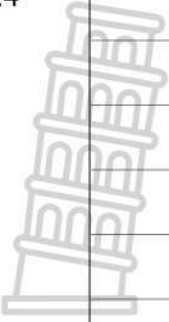



	Solution	Marks
7.1		(2)
7.2		(3)
7.3		(3)


7.4		
		(2)
7.5		
		(2)
		<b>[12]</b>

**QUESTION 8**


	Solution	Marks
8.1		(3)
8.2		(2)
8.3		(4)

8.4		
8.5	 Stanmorephysics.com	(3)
		(5) [17]


**QUESTION 9**

	<b>Solution</b>	<b>Marks</b>
9.1.1		
		(1)
9.1.2		
		(2)
9.2.1		
		(2)
9.2.2		
		(5)
		<b>[10]</b>

**QUESTION 10**

	<b>Solution</b>	<b>Marks</b>
10.1		(6)
10.2		(4)
		<b>[10]</b>

**TOTAL : 150**

	<b>Additional space</b>	<b>Marks</b>
		

	<b>Additional space</b>	<b>Marks</b>





**education**

Department:  
Education  
PROVINCE OF KWAZULU-NATAL

**FINAL & CLOSED  
MARKING  
GUIDELINES**

**MATHEMATICS P1**

**COMMON EXAM**

**NOVEMBER 2025**

**MARKING GUIDELINES**

Stanmorephysics.com

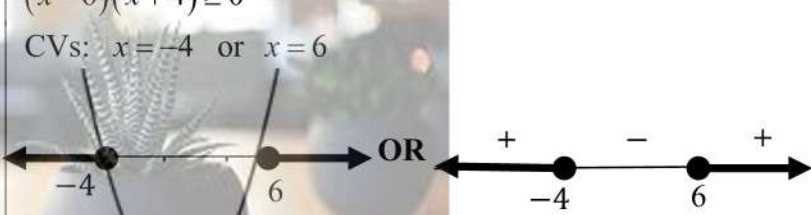
**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 11**

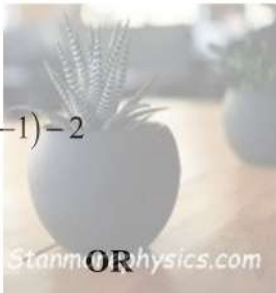
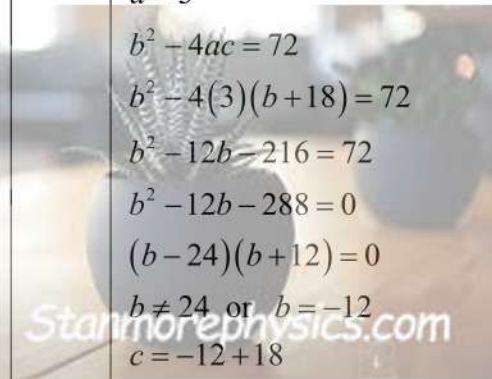
**MARKS: 150**

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



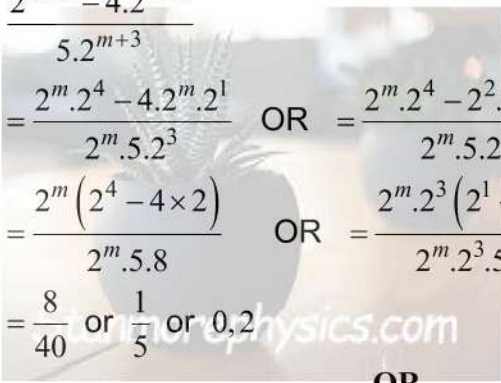
**QUESTION 1**

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

CAPS – Grade 11  
Marking Guidelines

<p>1.2.1</p>	$\frac{1}{2^y} = 4^{1-x}$ $2^{-y} = 2^{2(1-x)}$ $2^{-y} = 2^{2-2x}$ $-y = 2 - 2x$ $\therefore y = 2x - 2$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>1.2.1 is a proof, all marks are accuracy.</b></p> </div>	<p>✓A <math>2^{-y} = 2^{2(1-x)}</math></p> <p>✓A <math>-y = 2 - 2x</math></p> <p style="text-align: right;">(2)</p>
<p>1.2.2</p>	$x+6 = x^2 - y$ $x+6 = x^2 - (2x-2)$ $x^2 - 3x - 4 = 0$ $(x-4)(x+1) = 0$ $x=4 \text{ or } x=-1$ $y=2(4)-2 \text{ or } y=2(-1)-2$ $y=6 \text{ or } y=-4$ <div style="text-align: center; margin: 10px 0;">  <p><b>OR</b></p> </div> $x+6 = x^2 - y$ $y = x^2 - x - 6$ $(2x-2) = x^2 - x - 6$ $x^2 - 3x - 4 = 0$ $(x-4)(x+1) = 0$ $x=4 \text{ or } x=-1$ $y=2(4)-2 \text{ or } y=2(-1)-2$ $y=6 \text{ or } y=-4$	<p>✓A substitution</p> <p>✓CA factors</p> <p>✓CA both values of <math>x</math></p> <p>✓CA both values of <math>y</math></p> <p style="text-align: center;"><b>OR</b></p> <p>✓A substitution</p> <p>✓CA factors</p> <p>✓CA both values of <math>x</math></p> <p>✓CA both values of <math>y</math></p> <p style="text-align: right;">(4)</p>
<p>1.3</p>	$\Delta = 2 - (-2) = 4 \quad \& \quad \Delta = 2 - (-7) = 9$ $k = -2 \quad \text{or} \quad k = -7$	<p>✓A <math>k = -7</math>    ✓A <math>k = -2</math></p> <p style="text-align: right;">(2)</p>
<p>1.4</p>	$2a = 6$ $a = 3$ $b^2 - 4ac = 72$ $b^2 - 4(3)(b+18) = 72$ $b^2 - 12b - 216 = 72$ $b^2 - 12b - 288 = 0$ $(b-24)(b+12) = 0$ $b \neq 24 \text{ or } b = -12$ $c = -12 + 18$ $c = 6$ <div style="text-align: center; margin-top: 10px;">  </div>	<p>✓A value of <math>a</math></p> <p>✓CA subst. <math>a</math> &amp; <math>c</math> into <math>\Delta = 72</math></p> <p>✓CA standard form</p> <p>✓CA value of <math>b</math> with rejection</p> <p>✓CA value of <math>c</math></p> <p style="text-align: right;">(5)</p>
<b>[27]</b>		

**QUESTION 2**

<p>2.1.1</p>	$2x \cdot (27x^3)^{\frac{2}{3}} \cdot \left(\frac{2x}{27x^3}\right)^0$ $= 2x \cdot (3^3 x^3)^{\frac{2}{3}} \times 1$ $= 2x \cdot (3x)^{3 \times \frac{2}{3}}$ $= 2x(3x)^2$ $= 2x(3^2 x^2)$ $= 18x^3$ 	<p>✓A 1</p> <p>✓A <math>3^2 x^2</math></p> <p>✓CA answer</p> <p style="text-align: right;">(3)</p>
<p>2.1.2</p>	$\frac{(6 - 2\sqrt{3})^2}{\sqrt{3}}$ $= \frac{36 - 24\sqrt{3} + 12}{\sqrt{3}}$ $= \frac{48 - 24\sqrt{3}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$ $= \frac{48\sqrt{3} - 24 \times 3}{3}$ $= \frac{3(16\sqrt{3} - 24)}{3}$ $= 16\sqrt{3} - 24$ 	<p>✓A removing the brackets in numerator</p> <p>✓A rationalising denom. i.e. <math>\times \frac{\sqrt{3}}{\sqrt{3}}</math></p> <p>✓CA simplifying the numerator</p> <p>✓CA answer</p> <p style="text-align: right;">(4)</p>
<p>2.2.1</p>	$\frac{2^{m+4} - 4 \cdot 2^{m+1}}{5 \cdot 2^{m+3}}$ $= \frac{2^m \cdot 2^4 - 4 \cdot 2^m \cdot 2^1}{2^m \cdot 5 \cdot 2^3} \quad \text{OR} \quad = \frac{2^m \cdot 2^4 - 2^2 \cdot 2^m \cdot 2^1}{2^m \cdot 5 \cdot 2^3}$ $= \frac{2^m (2^4 - 4 \times 2)}{2^m \cdot 5 \cdot 8} \quad \text{OR} \quad = \frac{2^m \cdot 2^3 (2^1 - 1)}{2^m \cdot 2^3 \cdot 5}$ $= \frac{8}{40} \text{ or } \frac{1}{5} \text{ or } 0,2$  <p style="text-align: center;"><b>OR</b></p>	<p>✓A expansion using exponent law</p> <p>✓A factorising the numerator</p> <p>✓CA answer</p> <p style="text-align: center;"><b>OR</b></p> <p>✓✓A factorising the numerator</p> <p style="text-align: right;">(3)</p>

	$\frac{2^{m+4} - 4 \cdot 2^{m+1}}{5 \cdot 2^{m+3}}$ $= \frac{2^m(2^4 - 4 \times 2)}{2^m \cdot 5 \cdot 8} \quad \text{OR} \quad = \frac{2^m \cdot 2^3(2^1 - 1)}{2^m \cdot 2^3 \cdot 5}$ $= \frac{8}{40} \text{ or } \frac{1}{5} \text{ or } 0,2$ <p style="text-align: center;"><b>OR</b></p> $\frac{2^{m+4} - 4 \cdot 2^{m+1}}{5 \cdot 2^{m+3}}$ $= \frac{2^m \cdot 16 - 8 \cdot 2^m}{5 \cdot 2^m \cdot 8}$ $= \frac{2^m \cdot 8}{5 \cdot 2^m \cdot 8}$ $= \frac{8}{40} \text{ or } \frac{1}{5} \text{ or } 0,2$ <p style="text-align: center;"><b>OR</b></p> $\frac{2^{m+4} - 4 \cdot 2^{m+1}}{5 \cdot 2^{m+3}}$ $= \frac{2^{m+4}}{2^m \cdot 5 \cdot 8} - \frac{4 \cdot 2^{m+1}}{2^m \cdot 5 \cdot 8}$ $= \frac{2^{m+4-m}}{40} - \frac{4 \cdot 2^{m+1-m}}{40}$ $= \frac{16}{40} - \frac{8}{40}$ $= \frac{8}{40} \text{ or } \frac{1}{5} \text{ or } 0,2$	<p>✓CA answer (3)</p> <p style="text-align: center;"><b>OR</b></p> <p>✓A simplifying terms in numerator</p> <p>✓A adding like terms in numerator</p> <p>✓CA answer (3)</p> <p style="text-align: center;"><b>OR</b></p> <p>✓A splitting to two fractions</p> <p>✓A simplification</p> <p>✓CA answer (3)</p>
<p>2.2.2</p>	$5 = \frac{1}{125^x}$ $5 = \frac{1}{5^{3x}}$ $5 \cdot 5^{3x} = 1$ $5^{1+3x} = 5^0$ $1 + 3x = 0$ $x = -\frac{1}{3}$ <p style="text-align: center;"><b>OR</b></p>	<p>✓A equating <math>\frac{1}{125^x}</math> to 5</p> <p>✓A <math>5^{1+3x} = 5^0</math></p> <p>✓CA answer (3)</p> <p style="text-align: center;"><b>OR</b></p> <p>✓A equating <math>\frac{1}{125^x}</math> to 5</p>

CAPS – Grade 11  
Marking Guidelines

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

**QUESTION 3**

<p>3.1.</p>	<p>14</p>	<p>✓A answer</p> <p>(1)</p>
<p>3.2</p>	<p>2 ; 6 ; 10 ; 14</p> $T_n = 4n - 2$	<p>✓A <math>4n</math> ✓A <math>-2</math></p> <p>(2)</p>
<p>3.3</p>	$T_{10} = 4(10) - 2 \text{ or } T_5 = [2(10) - 1] \times 2$ $T_{10} = 38$ <div style="border: 1px solid black; padding: 2px; display: inline-block;"> <p><b>Answer only full marks</b></p> </div>	<p>✓CA subst. of <math>n = 10</math></p> <p>✓CA answer</p> <p>(2)</p>
<p>3.4</p>	$T_n = 4n - 2$ $710 = 4n - 2$ $4n = 712$ $n = 178$ <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-top: 10px;"> <p><b>Answer only full marks OR If <math>n</math> is a decimal, it must be rounded to whole number</b></p> </div> <p style="text-align: center; margin-top: 10px;"><b>OR</b></p>	<p>✓CA <math>T_n = 710</math></p> <p>✓CA answer</p> <p style="text-align: center;"><b>OR</b></p> <p>✓CA <math>T_n = 355</math></p> <p>(2)</p>

CAPS – Grade 11  
Marking Guidelines

	$2n - 1 = 355$ $2n = 356$ $n = 178$	✓CA answer (2)
3.5	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">                     Answer only full marks OR                      If <math>n</math> is a decimal, it must be rounded to whole number                 </div> <p>                     2 ; 6 ; 14 ; 26.....hearts quad seq                      4 ; 8 ; 12.....first difference                      4 ; 4 .....second difference  <math>2a = 4</math>     <math>3(2) + b = 4</math>     <math>2 - 2 + c = 2</math>  <math>a = 2</math>     <math>b = -2</math>     <math>c = 2</math>  <math>T_n = 2n^2 - 2n + 2</math>  <math>266 = 2n^2 - 2n + 2</math>  <math>2n^2 - 2n + 2 - 266 = 0</math>  <math>n^2 - n - 132 = 0</math>  <math>(n - 12)(n + 11) = 0</math>  <math>n = 12</math> or <math>n = -11</math>                      Only the 12<sup>th</sup> message.                 </p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;"> <math>n</math> must be a positive whole number                 </div> <p><b>OR</b></p> <p>                     1 ; 3 ; 7 ; 13.....faces quad seq                      2 ; 4 ; 6.....first difference                      2 ; 2 .....second difference  <math>2a = 2</math>     <math>3(1) + b = 4</math>     <math>1 - 1 + c = 1</math>  <math>a = 1</math>     <math>b = -1</math>     <math>c = 1</math>  <math>T_n = n^2 - n + 1</math>  <math>133 = n^2 - n + 1</math>  <math>n^2 - n + 1 - 133 = 0</math>  <math>n^2 - n - 132 = 0</math>  <math>(n - 12)(n + 11) = 0</math>  <math>n = 12</math> or <math>n = -11</math>                      Only the 12<sup>th</sup> message.                 </p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> <math>n</math> must be a positive whole number                 </div>	✓A 14 and 26 in NEW pattern  ✓A ALL values of $a, b$ & $c$ ✓CA general term ✓CA $T_n = 266$  ✓CA factors ✓CA both answers with rejection (6)  <b>OR</b> ✓A 7 and 13 in NEW pattern  ✓A ALL values of $a, b$ & $c$ ✓CA general term ✓CA $T_n = 133$  ✓CA factors ✓CA both answers with rejection (6)
<b>[13]</b>		

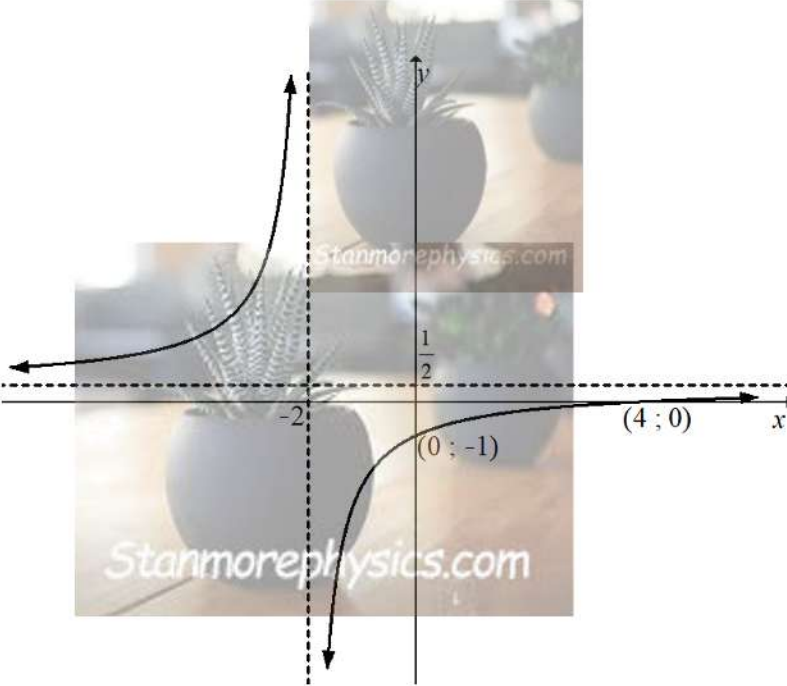
**QUESTION 4**

4.1.	$-7 ; m ; 5 ; n$ $(m+7) ; (5-m) ; (n-5)$ .....first difference $-2m-2 ; m+n-10$ .....second difference $\therefore -2m-2 = 4 \quad \therefore m+n-10 = 4$ $-2m = 6 \quad -3+n-10 = 4$ $m = -3 \quad n = 17$	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;"> <b>4.1 is a proof, all marks are accuracy.</b> </div> ✓ A sec diff. in terms of $m$ and $n$ ✓ A $-2m = 6$ ✓ A $-3+n-10 = 4$ (3)
4.2	$4 ; 8 ; 12$ ..... $4n = 292$ $n = 73$ $\therefore T_{73}$ and $T_{74}$ in a quadratic sequence	✓ A $4n = 292$ ✓ CA value of $n$ ✓ CA $T_{73}$ & $T_{74}$ (3)
4.3	$T_n = 2n^2 - 2n - 7$ $1005 = 2n^2 - 2n - 7$ $2n^2 - 2n - 1012 = 0$ $n^2 - n - 506 = 0$ $(n-23)(n+22) = 0$ $n = 23$ or $n = -22$ $T_{23} = 1005$	✓ A $T_n = 1005$ ✓ A standard form ✓ CA factors ✓ CA both answers with rejection (4)
<b>[10]</b>		

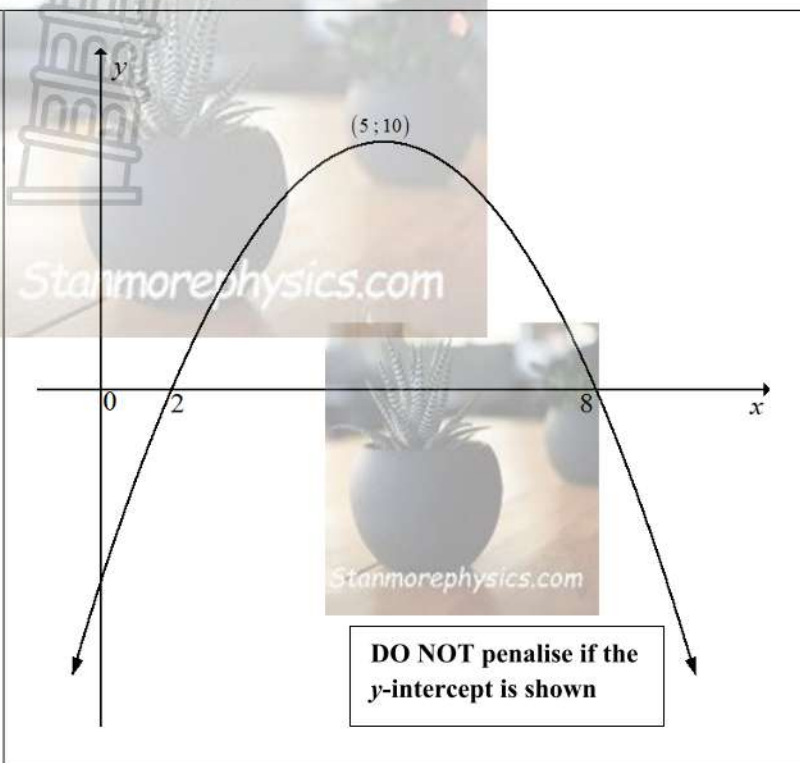
**QUESTION 5**


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

CAPS – Grade 11  
Marking Guidelines

<p>5.3</p>	$f(x) = \frac{-3}{x+2} + \frac{1}{2}$ $0 = \frac{-3}{x+2} + \frac{1}{2}$ $\frac{1}{2} = \frac{-3}{x+2}$ $-x - 2 = -6$ $-x = -4$ $x = 4$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>Answer only full marks, and ALL marks are accuracy since it is given</b></p> </div>	<p>✓A let <math>y = 0</math></p> <p>✓A answer</p> <p style="text-align: right;">(2)</p>
<p>5.4</p>		<p>✓A shape</p> <p>✓CA both asymptotes</p> <p>✓CA both intercepts</p> <p style="text-align: right;">(3)</p>
<p>5.5</p>	<p><math>y &gt; \frac{1}{2}</math> or <math>-1 \leq y \leq 0</math></p> <p><b>OR</b></p> <p><math>y \in \left(-\infty; \frac{1}{2}\right)</math> or <math>y \in [-1; 0]</math></p>	<p>✓✓A answer</p> <p><b>OR</b></p> <p>✓✓A answer</p> <p style="text-align: right;">(2)</p>
<p>5.6</p>	<p><math>p(x) = \frac{3}{x-2} + 2</math></p> <p><b>OR</b></p> <p><math>p(x) = \frac{-3}{-x+2} + 2</math></p>	<p>✓A <math>\frac{3}{x-2}</math> ✓A +2</p> <p><b>OR</b></p> <p>✓A <math>\frac{-3}{-x+2}</math> ✓A +2</p> <p style="text-align: right;">(2)</p>
<p><b>[12]</b></p>		

**QUESTION 6**

<p>6.1</p>		<p>✓ A T.P (5 ; 10)</p> <p>✓ A both x – intercepts.</p> <p>✓ A shape</p> <p>(3)</p>
<p>6.2.1</p>	<p><math>-x^2 + 9 = 0</math>  <math>x^2 - 9 = 0</math>  <math>(x+3)(x-3) = 0</math>  <math>x = -3</math> or <math>x = 3</math>  A(-3 ; 0)</p> <p style="text-align: center;"><b>OR</b></p> <p><math>-x^2 + 9 = 0</math>  <math>x^2 = 9</math>  <math>x = \pm 3</math>  <math>x = -3</math> or <math>x = 3</math>  A(-3 ; 0)</p>	<p>✓ A let <math>y = 0</math></p> <p>✓ A correct factors</p> <p>✓ CA answer</p> <p>(3)</p> <p style="text-align: center;"><b>OR</b></p> <p>✓ A let <math>y = 0</math></p> <p>✓ A isolating the square</p> <p>✓ CA answer</p> <p>(3)</p>

<p>6.2.2</p>	<p>Other <math>x</math>-intercept in <math>h</math> is <math>(9 \ 0)</math></p> $y = a(x - x_1)(x - x_2)$ $y = a(x + 3)(x - 9)$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> <p>Since 6.2.2 is a proof, all marks are accuracy.</p> </div> $\frac{27}{4} = a(0 + 3)(0 - 9) \quad \text{OR} \quad -9 = a(3 + 3)(3 - 9)$ $\frac{27}{4} = a(-27) \quad \text{OR} \quad -9 = -36a$ $a = \frac{1}{4}$ $\therefore y = \frac{1}{4}(x + 3)(x - 9)$ $\therefore y = \frac{1}{4}(x^2 - 6x - 27)$ $\therefore y = \frac{1}{4}x^2 - \frac{3}{2}x - \frac{27}{4}$ $a = \frac{1}{4} \quad \text{and} \quad b = -\frac{3}{2}$  <p><b>OR</b></p> <p><math>C(3; -9)</math></p> $y = a(x + p)^2 + q$ $y = a(x - 3)^2 - 9$ $0 = a(-3 - 3)^2 - 9 \quad \text{OR} \quad -\frac{27}{4} = a(0 - 3)^2 - 9$ $9 = a(36) \quad \text{OR} \quad \frac{9}{4} = 9a$ $a = \frac{1}{4}$ $y = \frac{1}{4}(x - 3)^2 - 9$ $y = \frac{1}{4}(x^2 - 6x + 9) - 9$ $y = \frac{1}{4}x^2 - \frac{3}{2}x - \frac{27}{4}$ $\therefore a = \frac{1}{4} \quad \text{and} \quad b = -\frac{3}{2}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> <p>Since 6.2.2 is a proof, all marks are accuracy.</p> </div>	<p>✓ A identifying <math>(9; 0)</math></p> <p>✓ A substitution of <math>x</math>-intercepts</p> <p>✓ A subst. of <math>\left(0; -\frac{27}{4}\right)</math> or <math>(3; -9)</math></p> <p>✓ A simplification of <math>h</math>.</p> <p style="text-align: right;">(4)</p> <p><b>OR</b></p> <p>✓ A identifying <math>C(3; -9)</math></p> <p>✓ A substitution of <math>C(3; -9)</math></p> <p>✓ A subst. <math>\left(0; -\frac{27}{4}\right)</math> or <math>(-3; 0)</math></p> <p>✓ A simplification to <math>h</math>.</p> <p style="text-align: right;">(4)</p>
<p>6.2.3</p>	<p><math>C(3; -9)</math></p> <p><math>y \in \mathbb{R} : y \geq -9</math></p> <p><b>OR</b></p> <p><math>C(3; -9)</math></p> <p><math>y \in [-9; \infty)</math></p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> <p>Answer only full marks</p> </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> <p>Answer only full marks</p> </div>	<p>✓ A <math>y_c = -9</math></p> <p>✓ A answer</p> <p><b>OR</b></p> <p>✓ A <math>y_c = -9</math></p> <p>✓ A answer</p> <p style="text-align: right;">(2)</p>

CAPS – Grade 11  
Marking Guidelines

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

**QUESTION 7**

7.1	$h(x) = 2^x + q$ $-7\frac{3}{4} = 2^{-2} + q$ $q = -8$	✓A substituting $\left(-2 ; -7\frac{3}{4}\right)$ ✓A answer (2)
7.2	$2^x - 8 = 0$ $2^x = 2^3$ $x = 3$ $A(3 ; 0)$	✓A let $y = 0$ ✓A $2^x = 2^3$  ✓A answer (3)

CAPS – Grade 11  
Marking Guidelines

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

**QUESTION 8**

8.1.	$A = P(1 + i \cdot n)$ $A = R 15000(1 + 0,10 \times 6)$ $A = R 24000$ Interest = R24000 – R15000 = R 9000  <b>OR</b> Interest = $p \times i \times n$ = $15000 \times 0,1 \times 6$ = R 9000	✓ A subst. into correct formula ✓ A value of A  ✓ CA answer (3)  <b>OR</b> ✓ A correct formula ✓ A subst. into correct formula ✓ CA answer (3)
8.2	$A = P(1 - i)^n$ $R 277\,216 = P(1 - 0,0825)^3$ $\frac{455625}{(1 - 0,0825)^3} = P$ $\therefore P = R 358\,922$	✓ A subst. to correct formula  ✓ CA answer (2)

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

CAPS – Grade 11  
Marking Guidelines

$$A_3 = 6500 \left(1 + \frac{0,13}{12}\right)^{24} \cdot \left(1 + \frac{0,105}{4}\right)^4 - x \dots \text{forward equation}$$

$$P_3 = \frac{7428,30}{\left(1 + \frac{0,105}{4}\right)^8} \dots \text{reverse equation}$$

$$A_3 = P_3$$

$$6500 \left(1 + \frac{0,13}{12}\right)^{24} \cdot \left(1 + \frac{0,105}{4}\right)^4 - x = \frac{7428,30}{\left(1 + \frac{0,105}{4}\right)^8}$$

$$-x = \frac{7428,30}{\left(1 + \frac{0,105}{4}\right)^8} - 6500 \left(1 + \frac{0,13}{12}\right)^{24} \cdot \left(1 + \frac{0,105}{4}\right)^4$$

$$-x = -R 3300$$

$$\therefore x = R3300$$

**OR**

$$A_3 = 6500 \left(1 + \frac{0,13}{12}\right)^{24} \cdot \left(1 + \frac{0,105}{4}\right)^4 \dots \text{forward equation}$$

$$P_3 = \frac{7428,30}{\left(1 + \frac{0,105}{4}\right)^8} + x \dots \text{reverse equation}$$

$$A_3 = P_3$$

$$6500 \left(1 + \frac{0,13}{12}\right)^{24} \cdot \left(1 + \frac{0,105}{4}\right)^4 = \frac{7428,30}{\left(1 + \frac{0,105}{4}\right)^8} + x$$

$$x = 6500 \left(1 + \frac{0,13}{12}\right)^{24} \cdot \left(1 + \frac{0,105}{4}\right)^4 - \frac{7428,30}{\left(1 + \frac{0,105}{4}\right)^8}$$

$$\therefore x = R3300$$

$$\checkmark A \quad 6500 \left(1 + \frac{0,13}{12}\right)^{24}$$

$$\checkmark A \quad \left(1 + \frac{0,105}{4}\right)^4 - x$$

$$\checkmark A \quad \left(1 + \frac{0,105}{4}\right)^8$$

$$\checkmark A \quad \text{ALL equated to } 7428,30$$

$\checkmark$  CA answer

(5)

**OR**

$$\checkmark A \quad 6500 \left(1 + \frac{0,13}{12}\right)^{24}$$

$$\checkmark A \quad \left(1 + \frac{0,105}{4}\right)^4 - x$$

$$\checkmark A \quad \left(1 + \frac{0,105}{4}\right)^8$$

$$\checkmark A \quad \text{ALL equated to } 7428,30$$

$\checkmark$  CA answer

(5)

**[17]**

**QUESTION 9**

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

If answer is CA,  
 $0 < P(B) < 1$

CAPS – Grade 11  
Marking Guidelines

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $0,7 = P(A) + \frac{5}{2}P(A) - P(A) \cdot \frac{5}{2}P(A)$ $0,7 = \frac{7}{2}P(A) - \frac{5}{2}P(A)^2$ $\frac{5}{2}P(A)^2 - \frac{7}{2}P(A) + \frac{7}{10} = 0 \quad \text{OR} \quad 25P(A)^2 - 35P(A) + 7 = 0$ $P(A) = \frac{-\left(-\frac{7}{2}\right) \pm \sqrt{\left(-\frac{7}{2}\right)^2 - 4\left(\frac{5}{2}\right)\left(\frac{7}{10}\right)}}{2\left(\frac{5}{2}\right)}$ $P(A) = \frac{-(-35) \pm \sqrt{(-35)^2 - 4(25)(7)}}{2(25)}$ $P(A) = 0,24 \quad \text{or} \quad P(A) \neq 1,16$ $P(A) = \frac{2}{5}P(B)$ $0,24 = \frac{2}{5}P(B)$ $\therefore P(B) = 0,60 \quad \text{or} \quad \frac{3}{5}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>If answer is CA,</b> <math>0 &lt; P(B) &lt; 1</math></p> </div>	<p>✓CA substitution to correct rule</p> <p>✓CA equation in terms of P(A)</p> <p>✓CA substitution into quadratic formula</p> <p>✓CA P(A)</p> <p>✓CA answer</p> <p style="text-align: right;">(5)</p>
<b>[10]</b>	

**QUESTION 10**

10.1.1	<p>Let the number of females who will love to buy Gucci be <math>x</math></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>Gucci</td> <td>Louis Vuitton</td> <td></td> </tr> <tr> <td>Males</td> <td><math>y</math></td> <td><math>2x</math></td> <td>45</td> </tr> <tr> <td>Females</td> <td><math>x</math></td> <td><math>3y</math></td> <td>85</td> </tr> <tr> <td></td> <td><math>x + y</math></td> <td><math>2x + 3y</math></td> <td>130</td> </tr> </table> <p><math>y + 2x = 45</math>.....line 1</p> <p><math>x + 3y = 85</math>.....line 2</p> <p><math>y = 45 - 2x</math>..... OR <math>x = 85 - 3y</math></p> <p><math>x + 3(45 - 2x) = 85</math> OR <math>y + 2(85 - 3y) = 45</math></p> <p><math>x + 135 - 6x = 85</math> OR <math>y + 170 - 6y = 45</math></p> <p><math>-5x = -50</math> OR <math>-5y = -125</math></p> <p><math>x = 10</math> <span style="margin-left: 150px;"><math>y = 25</math></span></p> <p style="margin-left: 150px;"><math>x = 10</math></p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b><math>x</math> must be a positive whole number</b></p> </div>		Gucci	Louis Vuitton		Males	$y$	$2x$	45	Females	$x$	$3y$	85		$x + y$	$2x + 3y$	130	<p>✓A males : <math>y + 2x = 45</math></p> <p>✓A females : <math>x + 3y = 85</math></p> <p>✓A <math>y = 45 - 2x</math> OR <math>x = 85 - 3y</math></p> <p>✓CA substitution</p> <p>✓CA simplification</p> <p>✓CA answer</p> <p style="text-align: right;">(6)</p>
	Gucci	Louis Vuitton																
Males	$y$	$2x$	45															
Females	$x$	$3y$	85															
	$x + y$	$2x + 3y$	130															

**OR**

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

$$45 - y = 2(85 - 3y)$$

$$45 - y = 170 - 6y$$

$$5y = 125$$

$$y = 25$$

$x = 10$  females who would love Gucci items



**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**

$$\checkmark A \quad M \text{ and } LV = 45 - y$$

$$\checkmark A \quad F \text{ and } Gucci = 85 - 3y$$

$$\checkmark A \checkmark A \quad 45 - y = 2(85 - 3y)$$

$$\checkmark CA \quad \text{values of } y$$

$$\checkmark CA \quad \text{answer}$$

(6)

**OR**

$$\checkmark A \quad 2(85 - 3y) \text{ or } 170 - 6y$$

$$\checkmark A \quad 85 - 3y$$

$$\checkmark A \checkmark A \quad 2(85 - 3y) + y = 45$$

$$\checkmark CA \quad \text{value of } y$$

$$\checkmark CA \quad \text{answer.}$$

(6)

10.2

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

$$= 0,19$$

$$P(M) \times P(G) = \frac{45}{130} \times \frac{35}{130}$$

$$= \frac{63}{675}$$

$$= 0,09$$

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

Both events are NOT independent

$$\checkmark CA \quad \frac{25}{130} \text{ or } \frac{5}{26} \text{ or } 0,19$$

$$\checkmark CA \quad \frac{45}{130} \times \frac{35}{130}$$

$$\checkmark CA \quad \frac{63}{675} \text{ or } \frac{7}{75} \text{ or } 0,09$$

$$\checkmark CA \quad \text{NOT independent}$$

(4)

CAPS – Grade 11  
Marking Guidelines

<p><b>OR</b></p> $P(M \text{ and } LV) = \frac{20}{130}$ $= 0,15$ $P(M) \times P(LV) = \frac{45}{130} \times \frac{95}{130}$ $= \frac{171}{676}$ $= 0,25$ <p><math>P(M \text{ and } LV) \neq P(M) \times P(LV)</math></p> <p>Both events are NOT independent</p>	<p><b>OR</b></p> $\checkmark \text{CA } \frac{20}{130} \text{ or } \frac{2}{13} \text{ or } 0,19$ $\checkmark \text{CA } \frac{45}{130} \times \frac{95}{130}$ $\checkmark \text{CA } \frac{171}{676} \text{ or } 0,25$ <p><math>\checkmark \text{CA NOT independent}</math></p> <p style="text-align: right;">(4)</p>
<b>[10]</b>	

**TOTAL: 150**

