



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
2015
GRADE 9**

MATHEMATICS

15 pages

2	MATHEMATICS
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**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION**

MATHEMATICS

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SECTION A and SECTION B based on the prescribed content framework in the CAPS document.

SECTION A: MULTIPLE CHOICE

QUESTION 1: TEN MULTIPLE CHOICE QUESTIONS BASED ON ALL FIVE CONTENT AREAS
ANSWER THIS SECTION ON THE ANSWER SHEET PROVIDED.

SECTION B: SEVEN QUESTIONS BASED ON FIVE CONTENT AREAS

QUESTION 2: NUMBERS, OPERATIONS AND RELATIONS

QUESTION 3: PATTERNS AND ALGEBRA

QUESTION 4: ALGEBRA

QUESTION 5: FUNCTIONS

QUESTION 6: SPACE AND SHAPES

QUESTION 7: MEASUREMENT

QUESTION 8: DATA HANDLING

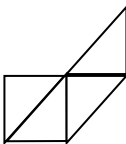
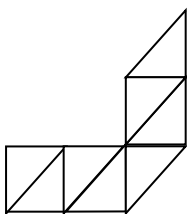
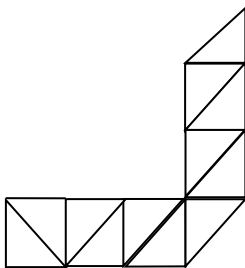
2. Answer ALL questions in both SECTIONS.
3. A non-programmable calculator may be used unless otherwise stated.
4. In SECTION A **circle** the letter of the correct answer; and if you change your decision cross out the circled letter and circle your new choice
5. In SECTION B show all necessary steps in your working unless otherwise stated.
6. When answering questions, candidates must apply their knowledge, skills and insight.
7. Number the answers correctly according to the numbering system used in this question paper.
8. Write neatly and legibly.

SECTION A

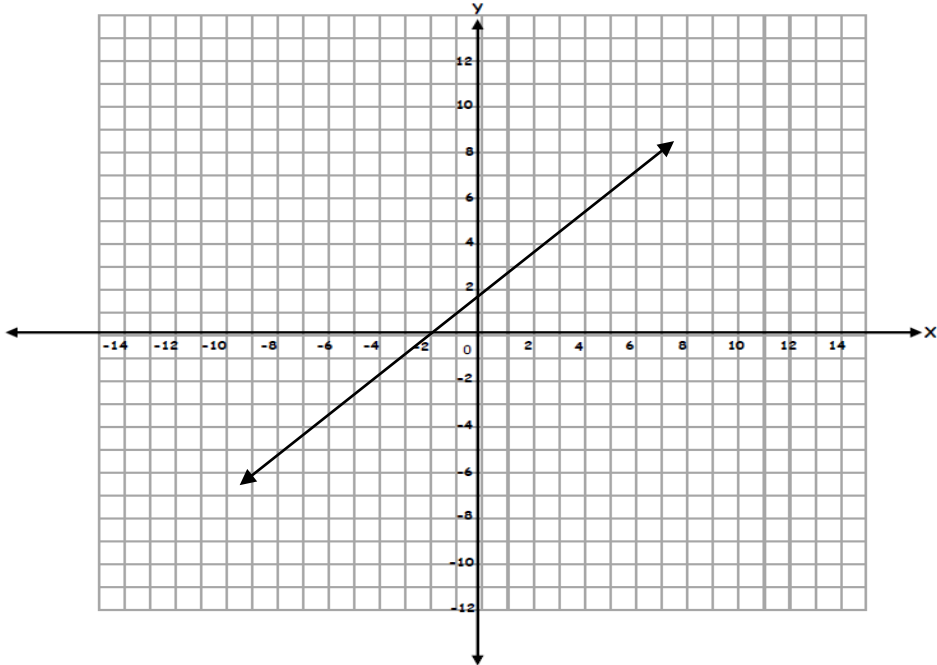
Question 1

1.	Circle the letter of the correct answer from the four possible answers.			
1.1	Simplify $\sqrt{4^2}$			
	A	16		
	B	4		
	C	2		
	D	8		(1)
1.2	Simplify $4,8 \div 0,2$			
	A	2,4		
	B	240		
	C	0,24		
	D	24		(1)
1.3	Study the pattern below and determine the terms represented by m and n . $2 ; 5 ; 8 ; m ; \dots ; 17 ; n ; \dots$			
	A	$m=10$ and $n=13$		
	B	$m=11$ and $n=21$		
	C	$m=9$ and $n=20$		
	D	$m=11$ and $n=20$		(1)
1.4	$(x-3)^2 = \dots\dots\dots$			
	A	$x^2 - 9$		
	B	$x^2 + 9x - 9$		
	C	$x^2 - 6x + 9$		
	D	$x^2 - 6x - 9$		(1)
1.5	If $2x+8=16$, then $x = \dots\dots\dots$			
	A	1		
	B	-4		
	C	1,6		
	D	4		(1)

	1.6	How many values of x satisfy the equation $5(x - 3) = -15 + 5x$																																																
		A	0				(1)																																											
		B	1																																															
		C	2																																															
		D	More than 2																																															
	1.7	The correct tally table for the following data 1 ; 2 ; 3 ; 1 ; 2 ; 3 ; 4 ; 1 ; 3 ; 2 ; 2 ; 1 ; 1 is:																																																
		A	<table><tr><th>Number</th><th>Tally</th></tr><tr><td>1</td><td> </td></tr><tr><td>2</td><td> </td></tr><tr><td>3</td><td> </td></tr><tr><td>4</td><td> </td></tr></table>	Number	Tally	1		2		3		4		B	<table><tr><th>Number</th><th>Tally</th></tr><tr><td>1</td><td> </td></tr><tr><td>2</td><td> </td></tr><tr><td>3</td><td> </td></tr><tr><td>4</td><td> </td></tr></table>	Number	Tally	1		2		3		4		C	<table><tr><th>Number</th><th>Tally</th></tr><tr><td>1</td><td> </td></tr><tr><td>2</td><td> </td></tr><tr><td>3</td><td> </td></tr><tr><td>4</td><td> </td></tr></table>	Number	Tally	1		2		3		4		D	<table><tr><th>Number</th><th>Tally</th></tr><tr><td>1</td><td> </td></tr><tr><td>2</td><td> </td></tr><tr><td>3</td><td> </td></tr><tr><td>4</td><td> </td></tr></table>	Number	Tally	1		2		3		4		(1)
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	1.8	Pairs of shoes are neatly packed in a drawer of a wardrobe. There are 4 pairs of black socks, 2 pairs of blue socks, 3 pairs of yellow socks and 5 pairs of white socks. One pair of socks is taken from the drawer without looking. What is the probability of not taking a pair of white socks? Show all your calculation.																																																
		A	5				(1)																																											
		B	$\frac{5}{14}$																																															
		C	$\frac{9}{14}$																																															
		D	$\frac{5}{9}$																																															
	1.9	A polygon can be defined as:																																																
		A	A closed three-dimensional shape with straight sides				(1)																																											
		B	A closed two-dimensional shape with less than three sides																																															
		C	A closed plain figure with straight sides																																															
		D	A closed figure with length, width and height																																															
	1.10	The height of a cube with a volume of 64 cm^3 is:																																																
		A	16 cm				(1)																																											
		B	8 cm																																															

		C	4 cm											
		D	32 cm											
				[10]										
SECTION B														
Question 2														
2.1	Determine the value of b in $\frac{3}{5} + \frac{2}{b} = 1$			(1)										
2.2	Determine 20% of an amount if 10% of the amount is R400			(1)										
2.3	Which number is the biggest? $3\sqrt{2}$ Or $2\sqrt{3}$?			(1)										
2.4	Simplify without using a calculator $(2x)^3 \times -2x^2$			(2)										
2.5	Paul invests R2000 at 6% compound interest per annum. How much money will he have at the end of 5 years?			(3)										
2.6	Sandra borrowed R2500 from her friend. They agreed that she will repay all the money over a certain period of time plus simple interest of 9% p.a. How long did it take her to repay all the money if the total interest paid was R675?			(3)										
2.7	If the sizes of the angles of a triangle are in the ratio 5: 6: 7. Calculate the size of the largest angle.			(3)										
				[14]										
Question 3														
3.1	Study the pattern bellow and answer the questions that follow.													
	   Figure 1 Figure 2 Figure 3													
3.1.1	Copy and complete the table.													
	<table><tr><td>Figure</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Number of Triangles</td><td>4</td><td>8</td><td></td><td></td></tr></table>			Figure	1	2	3	4	Number of Triangles	4	8			(2)
Figure	1	2	3	4										
Number of Triangles	4	8												
3.1.2	Describe the pattern in words.			(1)										

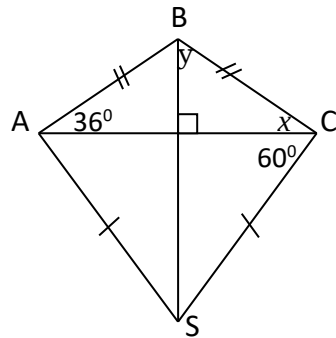
3.1.3	Determine the general rule (T_n) for the pattern.	(1)
3.2	Factorise completely.	
3.2.1	$3p^2q + 15pq^2 - 12pq$	(2)
3.2.2	$3x(x-3) + 2(3-x)$	(3)
3.2.3	$75x^3 - 12x$	(3)
3.3	Find the value of $2x^2 + 5x - 12$ if $x = 3$	(3)
		[15]
Question 4		
4.1	Simplify.	
4.1.1	$\frac{2x^3y^3}{2x^4} \times \frac{4xy^3}{6y} \times \frac{3x^2}{xy^3}$	(4)
4.1.2	$\sqrt[3]{\frac{54x^6}{2x^3}} - \sqrt{\frac{8x^2y^3}{2y}}$	(3)
4.1.3	$\frac{y+4}{3} - \frac{3y+2}{4}$	(4)
4.1.4	$\frac{(x+3)(x-2)}{4-2x}$	(3)
4.1.5	$-3(x+2) + 4x - 3 + 2(2x-1)$	(3)
4.2	Solve for x	
4.2.1	$3(x+1) = 2x+3$	(3)
4.2.2	$\frac{2x+1}{3} = 5 - \frac{1}{2}x$	(5)
4.2.3	$2^{x+1} = 16$	(3)
4.3	If I multiply a certain number by 5, I get the same answer as when I subtract the number from 48. What is the number?	(3)
		[31]
Question 5		
5.1	In a straight line graph defined by $4x + 2y = -3$,	
5.1.1	Determine the gradient of the graph.	(2)
5.1.2	Determine the x -intercept of the graph.	(2)

	5.1.3	Determine the y-intercept of the graph.	(1)
	5.1.4	Draw the graph showing all your intercepts. Use Annexure B.	(2)
5.2	Study the straight line below and answer the questions that follow.		
			
	5.2.1	Calculate the gradient of the graph.	(2)
	5.2.2	Determine the equation of the graph and write it in the form $y = mx + c$	(2)
			[11]

Question 6

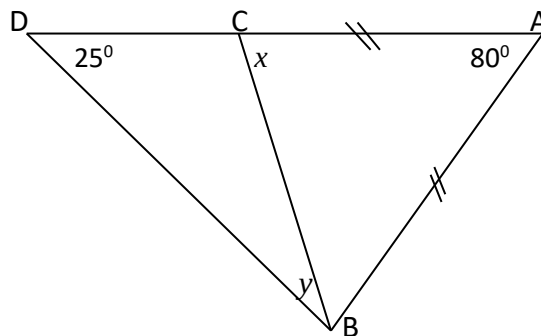
6.1 Determine with reasons, the sizes of angles x and y in each diagram below.

6.1.1

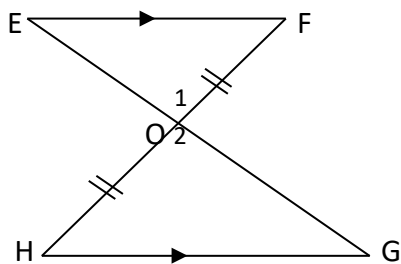


(4)

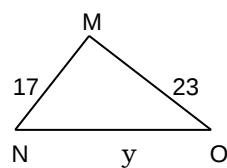
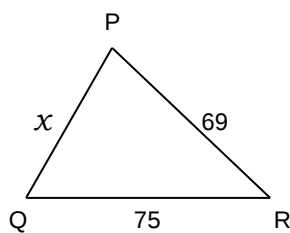
6.1.2



(4)

6.2 Study the sketch below and prove that $\triangle EFO \equiv \triangle GHO$ 

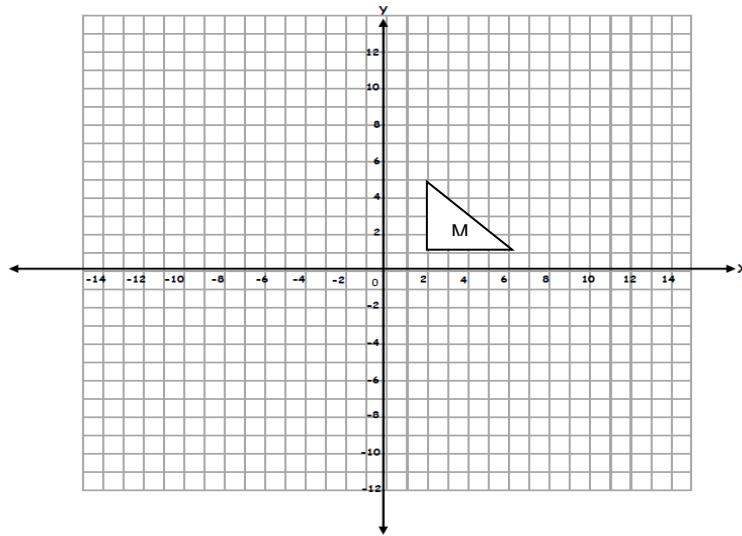
(4)

6.3 $\triangle PQR \sim \triangle MNO$. Find the lengths of unknown sides, x and y .

(5)

6.4

Enlarge ΔM with a scale factor 2. $O(0; 0)$ is the Centre of enlargement. **Use Annexure C.**

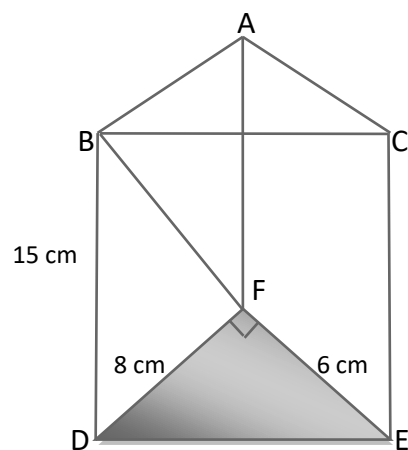


(3)

[20]

Question 7

- 7.1 A triangular prism is shown in the figure below. The base is a right-angled triangle with $DF = 8$ cm, $FE = 6$ cm and the height 15 cm.



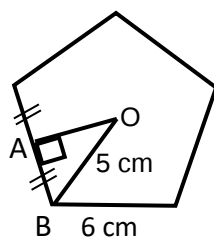
- 7.1.1 Calculate the area of ΔDEF .

(2)

- 7.1.2 Calculate the volume of the prism.

(2)

7.2 Given a regular pentagon with sides of 6 cm.



7.2.1 Calculate the perimeter of the pentagon.

(1)

7.2.2 Calculate the length of OA.

(3)

7.2.3 Calculate the area of the regular pentagon.

(3)

[11]

Question 8

8.1 A survey was conducted to test the relationship between the hand and shoe size. The table below shows 10 measurements of different hand lengths and shoe sizes.

Hand length	5	7	2	9	6	7	4	9	8	5
Shoe size	12	13	10	15	12	15	11	16	15	11

8.1.1 Use **Annexure D** to draw a scatter plot using the information in the table.

(4)

8.1.2 Draw a line of best fit.

(1)

8.1.3 What conclusion can you draw about the relationship between a hand length and a shoe size?

(1)

8.1.4 Find the mode for the shoe size.

(1)

8.1.5 Calculate the mean for the shoe size.

(2)

8.1.6 Determine the range for the hand size.

(1)

[10]

TOTAL: 120

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ANSWER-SHEET

ANNEXURE A

Name: _____

Class: _____

Section A

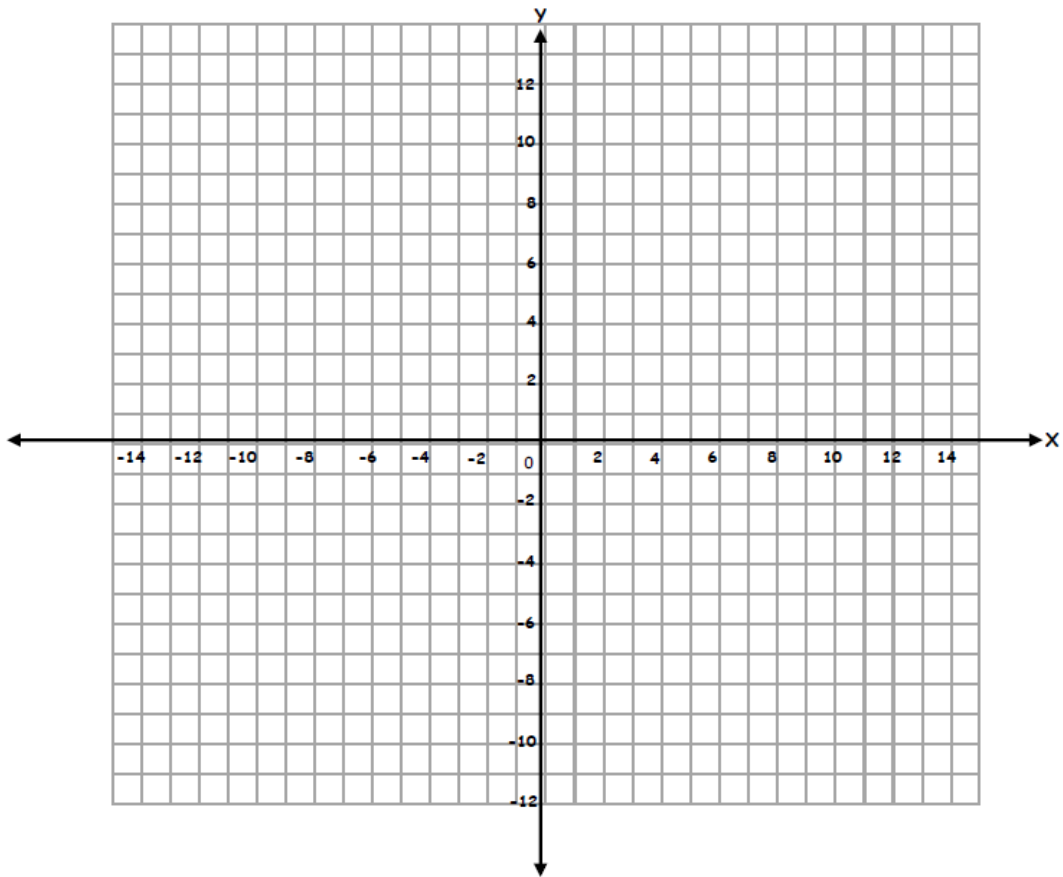
Marks: _____
10

Circle the letter of the correct answer. **Submit this with your answer sheet.**

Question	Answer			
1.1	A	B	C	D
1.2	A	B	C	D
1.3	A	B	C	D
1.4	A	B	C	D
1.5	A	B	C	D
1.6	A	B	C	D
1.7	A	B	C	D
1.8	A	B	C	D
1.9	A	B	C	D
1.10	A	B	C	D

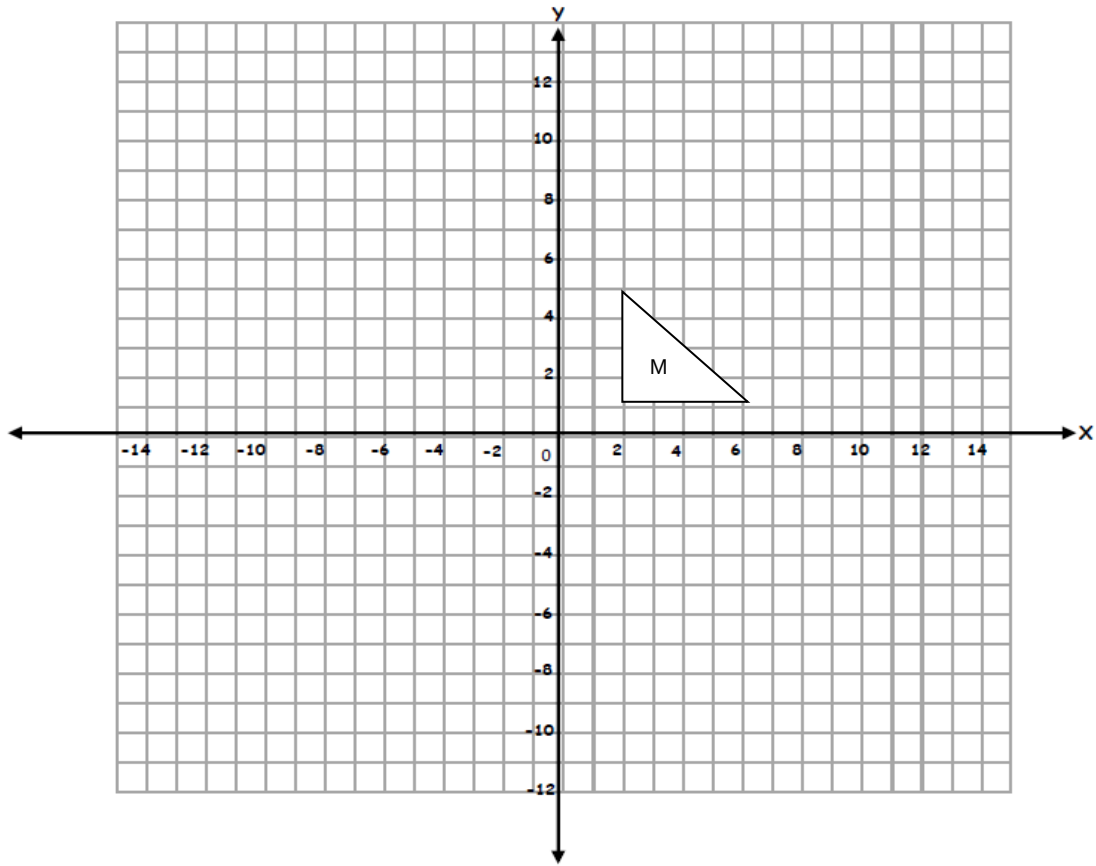
QUESTION 5.1.4

ANNEXURE B



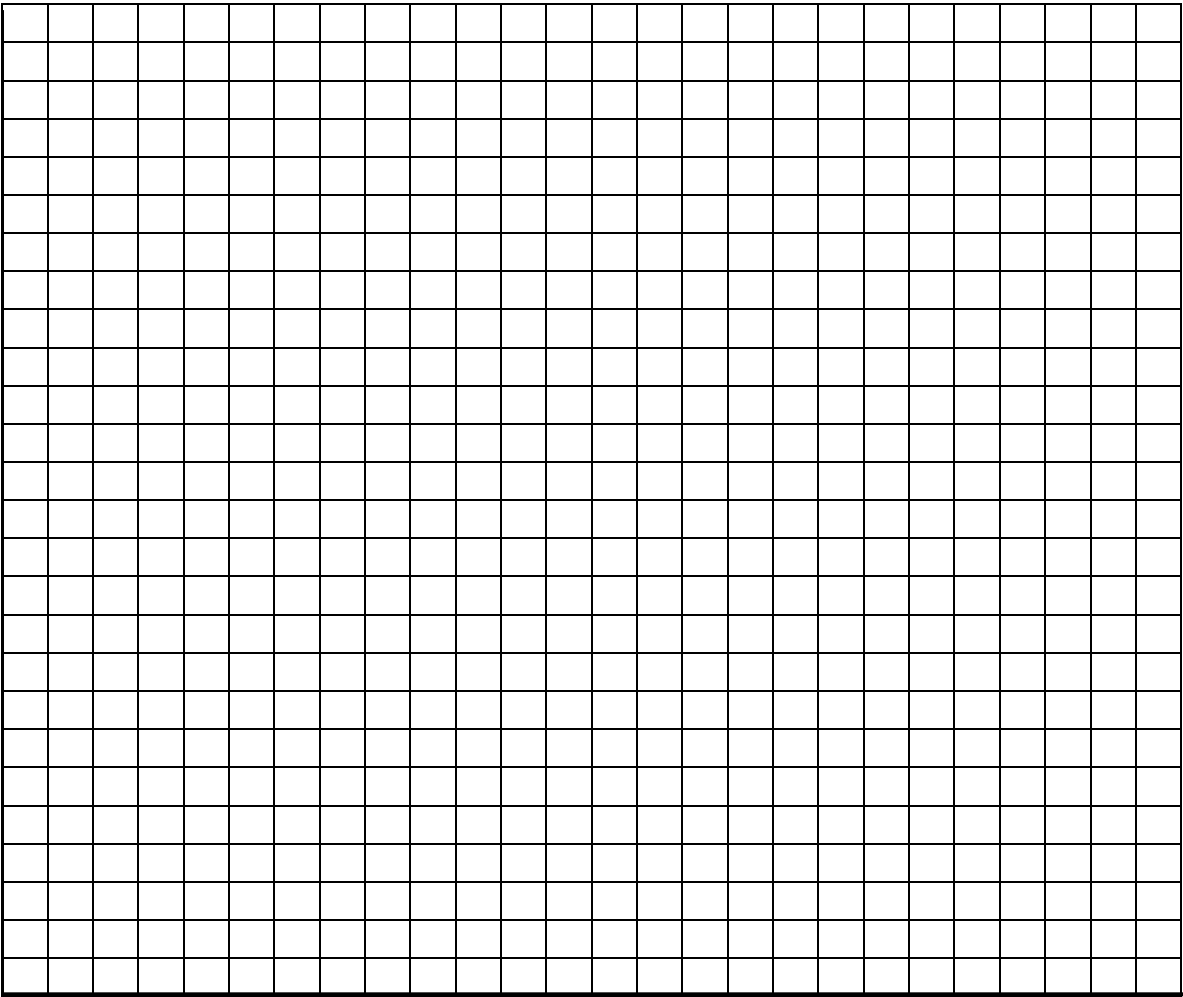
QUESTION 6.4

ANNEXURE C



QUESTION 8.1.1

ANNEXURE D



FORMULA-SHEET

ANNEXURE E

Simple Interest:

$$I = \frac{Prn}{100}$$

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

$$A = P\left(1 + \frac{rn}{100}\right)$$

Compound Interest:

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

$$A = P\left(1 + \frac{r}{100}\right)^n$$

	Perimeter	Area
Square	$4(l)$	l^2
Rectangle	$2(l + b)$	$l \times b$
Circle	$2\pi r$	πr^2
Triangle	$(s1 + s2 + s3)$	$\frac{1}{2}b \times \perp h$
Parallelogram	$2(b + l)$	$b \times \perp h$
Trapezium	Sum of the 4 sides	$\frac{1}{2}(a + b) \times \perp h$ a and b = parallel lines
Rhombus	$4l$	$b \times \perp h$
Kite	$2(a + b)$ a and b = length of equal sides	$\frac{1}{2} \times d_1 d_2$ d_1 and d_2 = diagonal

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