basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL ASSESSMENT
GENERAL EDUCATION CERTIFICATE (GEC)

2024 GRADE 9 PILOT STUDY

Subject: Mathematics

Paper: 1

Marks: 75

Duration: 2 hours

Excluding 15 minutes reading time.

This test consists of 23 pages, excluding the cover page.

Instructions to the learner:

1. You will receive 15 minutes reading time before you begin answering this test.
2. Read all the instructions and questions carefully.
3. Answer all the questions.
4. Answer all the questions in the answer booklet provided.
5. In Section A, do your calculations before choosing the correct option.
6. In Section B, show all the necessary calculations.
7. Non-programmable scientific calculators may be used, unless otherwise stated.
8. Diagrams are not necessarily drawn to scale, all lines are regarded as straight lines unless stated otherwise.

The test starts on the next page.



Do not turn the page until you are told to do so.

SECTION A

1. Which number is undefined?

   A $\frac{0}{8}$

   B $\sqrt{8}$

   C $\sqrt[3]{-8}$

   D $\frac{8}{0}$ (1)

2. Given: 125; 200 and 510

   What is the HCF of the numbers?

   A 10

   B 5

   C 17

   D 2 (1)

3. What is the LCM of 75; 450 and $1\,800$?

   A $1\,800$

   B 30

   C $3\,600$

   D 75 (1)

4.

Time	12	9	8	6
Average speed	60	80	90	120

   What is the relationship of average speed to time in the table?

   A Rate

   B Ratio

   C Indirect proportion

   D Direct proportion (1)

5. Thuto runs 6 km in 24 minutes.

How long will it take him to run 10 km at a constant speed?

A $\frac{1}{4}$ hour

B $\frac{2}{5}$ hour

C $\frac{2}{3}$ hour

D $\frac{5}{2}$ hour (1)

6. Dibolelo bought shares for R5 300 at the beginning of March 2006. She sold the shares at the end of February 2023 and received R11 291,45.
What was the compound interest rate per annum?

A $4{,}5\ \%$

B $4{,}4\ \%$

C $4{,}3\ \%$

D $4{,}1\ \%$ (1)

7. $(-a \times b)(e \times -g)$

Which of the following expressions is an example of the commutative property?

A $(-a + e) + (b - g)$

B $(-a - g) \times (b \times e)$

C $(-a \times e)(b \times -g)$

D $(-a + b)(e - g)$ (1)

8. What is the additive inverse and multiplicative inverse of $\frac{1}{5}$?

A $-\frac{1}{5}$ and -5

B $-\frac{1}{5}$ and 5

C $\frac{1}{5}$ and -5

D $\frac{1}{5}$ and 5 (1)

9. Simplify: $6-(3-5)+9-(-15)\div 3$

A 22

B 12

C 16

D 20 (1)

10. $\frac{5(3)(4)-5[3-4(3)]}{-3-2}$

What is the value of the expression?

A -21

B 3

C -3

D 27 (1)

11. Evaluate: $\frac{\sqrt[3]{125}-3^2+0+1}{-4+\sqrt{121}-\sqrt[3]{64}}$

A 1

B $\frac{5}{3}$

C $-\frac{4}{3}$

D -1 (1)

12. Simplify: $\left(\frac{\sqrt[3]{27}+\sqrt{\frac{50}{2}}}{\frac{4^2-\sqrt[3]{8}}{\sqrt{49}}}\right)^2$

A 16

B 4

C 1

D 49 (1)

13. Simplify: $3n^3 \times 2n^2$

A $6n^5$

B $5n^5$

C $6n^6$

D $5n^6$ (1)

14. Simplify: $(-2x^2y)^3$

A $8x^6y^3$

B $-8x^6y^3$

C $-8x^5y^3$

D $8x^5y^3$ (1)

15. Evaluate: $2^{-2} \times 6^3 \times 3^{-2}$

A 6

B $\frac{1}{36}$

C $\frac{1}{11}$

D 5 (1)

16. Simplify: $-3(x^{-1}y^2)^{-3} \times (xy)^{-5}$

A $\frac{-1}{9x^8y^5}$

B $\frac{1}{9x^8y^5}$

C $\frac{-3}{x^2y^{11}}$

D $\frac{-3}{x^{-2}y^{-11}}$ (1)

17. Simplify: $\left(\frac{y^2 + \frac{1}{y^{-2}}}{y^2 \times y^2}\right)^{-2}$

A $4y^4$

B $\frac{y^4}{4}$

C $-4y^4$

D $-\frac{y^4}{4}$ (1)

18. Simplify: $\frac{\sqrt{4x^6y^{-2}} \times (x^2)^{-2}}{(2x)^0 \times y^{-3}}$

A $\frac{xy^2}{2}$

B $\frac{y^2}{2x}$

C $\frac{2}{x^{-1}y^2}$

D $\frac{2y^2}{x}$ (1)

19. $\frac{1}{2}; \frac{3}{2}; \frac{5}{2}; \frac{7}{2}; \ldots$

Which statement best describes the rule of the pattern?

A Add 2 to the previous term to get the next term.

B Add 1 to the previous term to get the next term.

C Numerators are odd numbers.

D Denominators are equal to 2. (1)

20. $0; 1; 1; 2; 3; 5; \ldots$

What are the next two terms in the sequence?

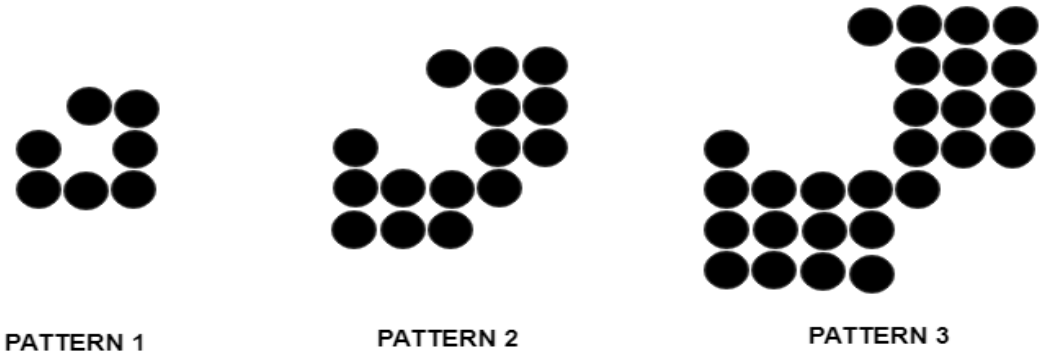
A $8; 13$

B $7; 9$

C $6; 8$

D $7; 13$ (1)

21.



Which pattern represents pattern 4?

A 

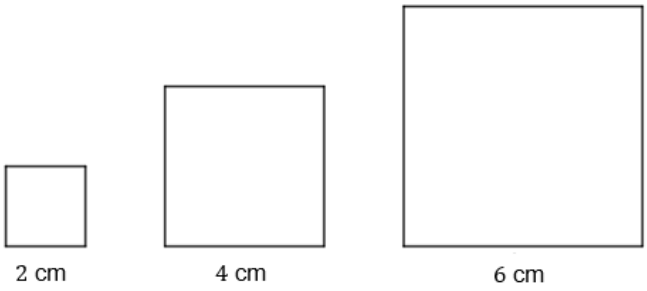
B 

C 

D 

(1)

22. Jay makes a pattern with squares.



What will the area of the 9th square be?

A 324 cm^2

B 256 cm^2

C 81 cm^2

D 18 cm^2 (1)

23. Which of the following are like terms?

A $2pqr^2$ and $4p^2qr$

B $-7pq^2$ and $-7pr^2$

C $5pq^2r$ and $2pqr^2$

D $-3pq^2r$ and $5pq^2r$ (1)

24. $-2x^3 + 3x^2 - x + 8$

What is the exponent of the term with the smallest coefficient?

A 0

B 1

C 2

D 3 (1)

25. $-5xy \times x^5 - \frac{y^2}{3} + 5(x)$

How many terms are in the expression?

A 6

B 5

C 4

D 3 (1)

26. Simplify: $-3y(2y^2 - 4y) - 1$

A $-6y^3 + 12y^2 - 1$

B $6y^3 - 12y^2 - 1$

C $-6y^3 + 12y^2 + 3y$

D $6y^3 - 12y^2 - 3y$ (1)

27. Simplify: $\frac{15y^3 - 3y(-y + 2) + 6y^2}{3y}$

A $5y^2 + y - 2$

B $3y^3 + 5y^2 - 2$

C $11\mathrm{y}^2 + \mathrm{y} - 2$

D $5y^2 + 3y - 2$ (1)

28. Simplify: $\sqrt{y^8 + \frac{9}{16}y^8}$

A $\frac{5y^8}{4}$

B $\frac{7y^4}{4}$

C $\frac{5y^4}{4}$

D $\frac{7y^8}{4}$ (1)

29. $\left(4x - \frac{1}{2}\right)^2$

What is the product?

A $16x^2 - \frac{1}{4}$

B $16x^2 - 4x + \frac{1}{4}$

C $16x^2 + \frac{1}{4}$

D $16x^2 - 4x - \frac{1}{4}$ (1)

30. $\frac{9p^2 - 8q}{r}$

What is the numerical value of the expression if

$p = -1, q = 0{,}125$ and $r = \frac{1}{2}$?

A 4

B 7

C 16

D 20 (1)

31. Factorise: $25a^2 - 16b^2$

A $(5a - 4b)(5a + 4b)$

B $(5a + 16b)(5a - 16b)$

C $(25a - 4b)(25a + 4b)$

D $(25a + 16b)(25a - 16b)$ (1)

32. Factorise: $y^2 - 11y + 28$

A $(y - 4)(y + 7)$

B $(y + 7)(y + 4)$

C $(y - 7)(y - 4)$

D $(y + 4)(y - 7)$ (1)

33. Factorise: $9p^2 + 27p - 90$

A $9(p + 5)(p + 2)$

B $9(p - 2)(p + 5)$

C $9(p - 5)(p + 2)$

D $9(p - 2)(p - 5)$ (1)

34. Simplify: $\frac{2a^2 - 10a + 12}{a(a + 2) - 3(a + 2)}$

A $\frac{2(a + 3)}{a - 3}$

B $\frac{2(a - 3)}{a + 3}$

C $\frac{2(a - 2)}{a + 2}$

D $\frac{2(a + 2)}{a - 2}$ (1)

35. Simplify: $\frac{48r - 3r(p + q)^2}{12r + 3pr + 3qr}$

A $4 - p + q$

B $4 + p - q$

C $4 - p - q$

D $4 + p + q$ (1)

36. $-2 = -4m$

What is the value of m?

A $-\frac{1}{2}$

B 2

C -2

D $\frac{1}{2}$ (1)

37. $\frac{a}{7} = -2$

What is the value of a?

A 14

B -14

C -9

D 9 (1)

38. Solve: $(x-4)^2 = 0$

A $x = 4$

B $x = -4$

C $x = 2$ or $x = -2$

D $x = 0$ or $x = 4$ (1)

39. $(x-3)(1-x) = 0$

What are the values of x?

A $x = 3$ or $x = -1$

B $x = -3$ or $x = 1$

C $x = 3$ or $x = 1$

D $x = -3$ or $x = -1$ (1)

40. Marius buys cell phones for x rands each and sells them to make a profit. He determines his selling price, y rands, for each phone by doubling the price he paid and then subtracting three rand.

Which equation represents the scenario?

A $y = (x-3)^2$

B $y = 2(x-3)$

C $y = x^2 - 3$

D $y = 2x - 3$ (1)

41. The perimeter of a square is given as P $= 4(x - 1)$ and P $= 16$ cm.
What is the value of x?

A 5
B 21
C 3
D 13 (1)

42. $y = x^2 - 1$

x	-2	-1	0	1	2
y	3	0	-1	1	3

Which ordered pair does **NOT** satisfy the equation?

A $(-2; 3)$
B $(0; -1)$
C $(1; 1)$
D $(2; 3)$ (1)

43. $x^2 - 3x - 18 = 0$
What are the values of x?

A $x = -6$ or $x = -3$
B $x = 6$ or $x = -3$
C $x = -6$ or $x = 3$
D $x = 6$ or $x = 3$ (1)

44. $2^m + 0{,}5 = 8^0$
What is the value of m?

A 1
B -1
C 2
D -3 (1)

45. $\frac{6x}{3} - x = 4x^2$

Determine the values of x.

A 0 or $\frac{1}{4}$

B 3 or $\frac{1}{4}$

C 0 or $-\frac{1}{4}$

D 3 or $-\frac{1}{4}$ (1)

46. The product of two consecutive even numbers is 120.

Determine the two numbers.

A -30 and 4

B 30 and 4 or -4 and -30

C 10 and 12 or -10 and -12

D -10 and 12 (1)

47.

Input	-1	2	5	8
Output	b	-1	2	5

What is the value of b?

A -2

B -4

C 2

D 4 (1)

48. $y = -2x - 3$

What is the output value if the input value is -5?

A -3

B -5

C 7

D 1 (1)

49. 

What is the rule used in the flow diagram?

A Multiply by -2

B Multiply by -1

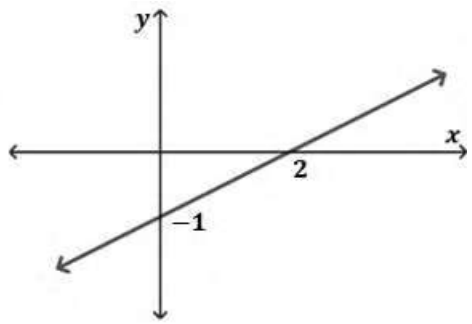
C Multiply by -6

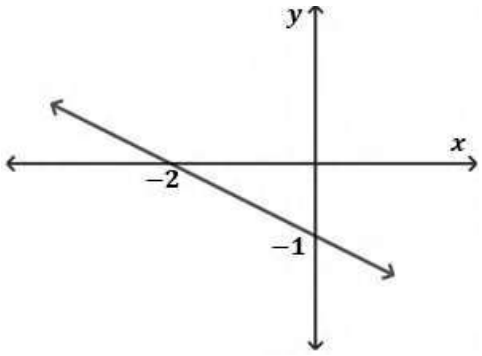
D Multiply by -3 (1)

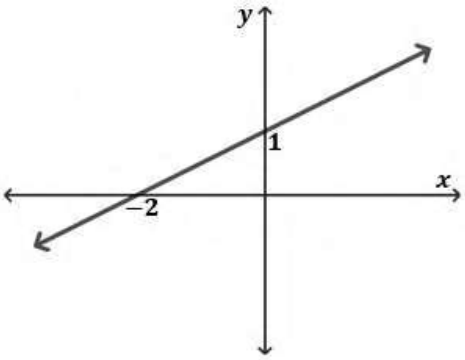
50.

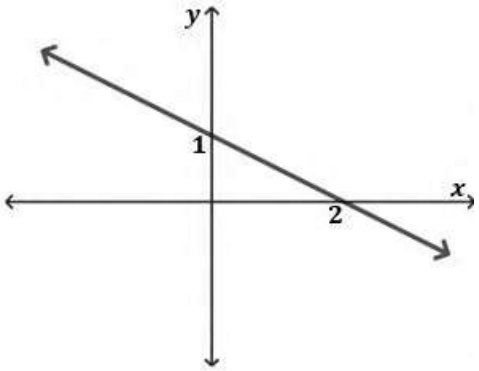
x	-2	-1	0	1	2	3
y	0	$\frac{1}{2}$	1	$\frac{3}{2}$	2	$\frac{5}{2}$

Which graph represents the relationship between x and y in the table?

A 

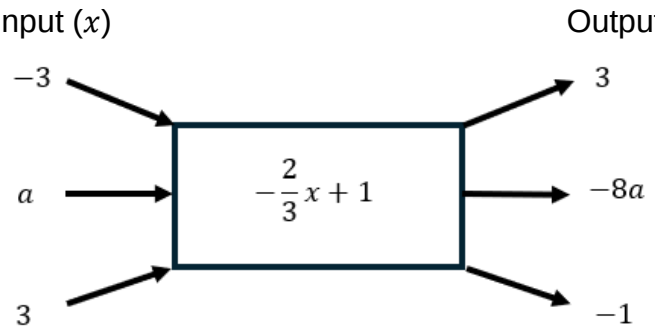
B 

C 

D 

(1)

51.



What is the value of a?

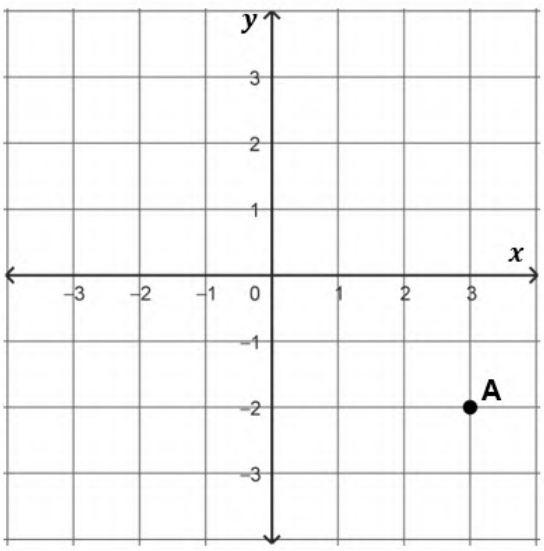
A -3

B 3

C $\frac{3}{26}$

D $\frac{-3}{22}$ (1)

52. Point A$(3;-2)$ is translated 1 unit to the left and 2 units up to point A′. Points A and A′ are joined to form a straight line.



Which equation represents the straight line?

A $y=-2x$

B $y=-2x+4$

C $y=2x-4$

D $y=2x$ (1)

53. $y = -2x + 3$

What are the coordinates of the y-intercept?

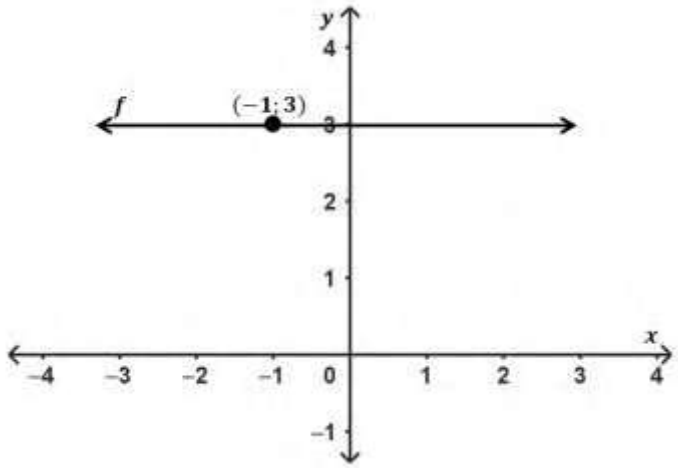
A $(-2;0)$

B $(0;-2)$

C $(0;3)$

D $(3;0)$ (1)

54.



What is the equation of f?

A $x = 3$

B $y = 3$

C $y = -1$

D $x = -1$ (1)

55. $y = -\frac{3}{2}x + \frac{5}{2}$

What is the gradient of the line?

A 2

B 3

C $-\frac{2}{3}$

D $-\frac{3}{2}$ (1)

56.

x	-2	0	1
y	0	-2	-3

Which equation is represented by the table?

A $y = -x - 2$

B $y = x - 2$

C $y = -2x + 1$

D $y = 2x - 3$ (1)

57. $4x + 2y = 8$

What are the coordinates of the x- and y-intercepts of the graph represented by the equation?

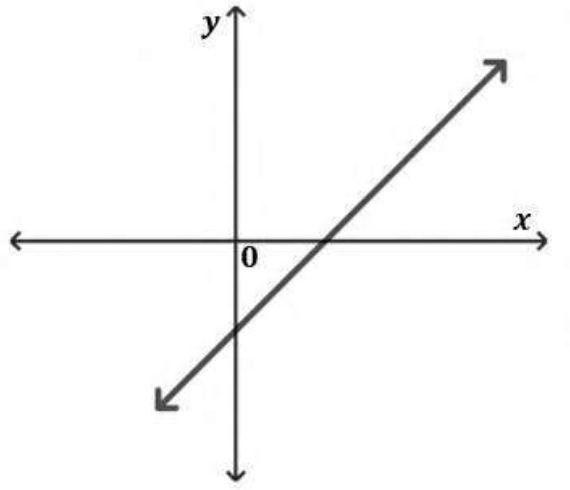
A $(0; -2)$ and $(8;0)$

B $(8;0)$ and $(-2;0)$

C $(4;0)$ and $(0;2)$

D $(2;0)$ and $(0;4)$ (1)

58. The graph represents $y = mx + c$.



What can be deduced from the graph?

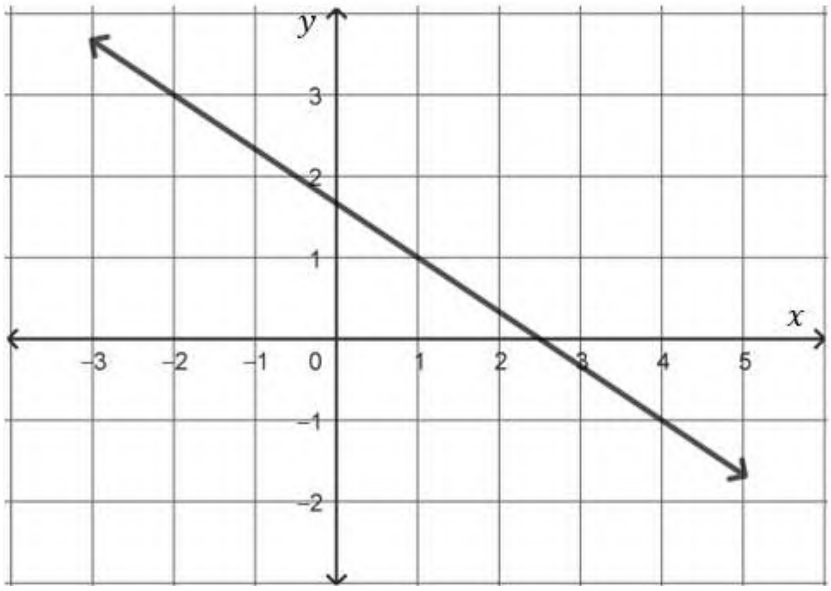
A $c > 0; m > 0$

B $c > 0; m < 0$

C $c < 0; m > 0$

D $c < 0; m < 0$ (1)

59.



What is the gradient of the line?

A $\frac{3}{2}$

B 1

C -1

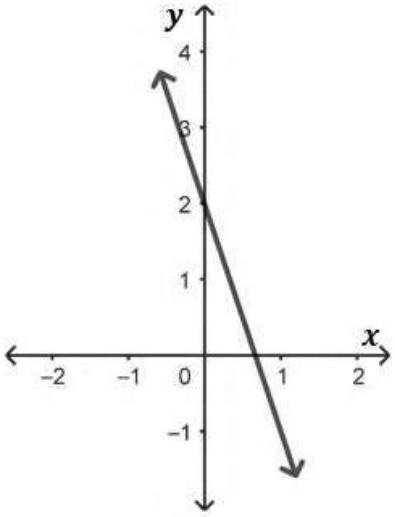
D $-\frac{2}{3}$

(1)

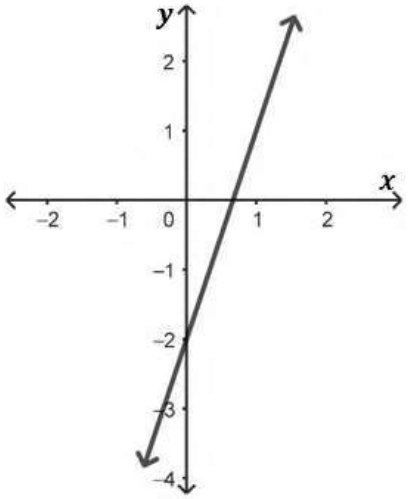
60. $2y - 6x - 4 = 0$

Which graph represents the equation?

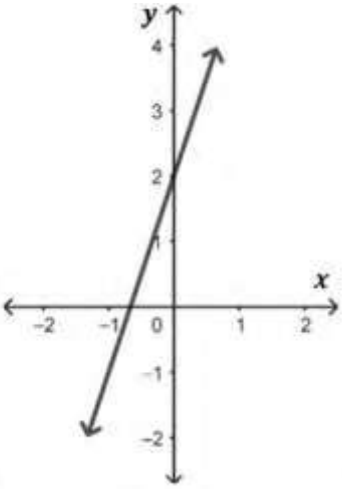
A



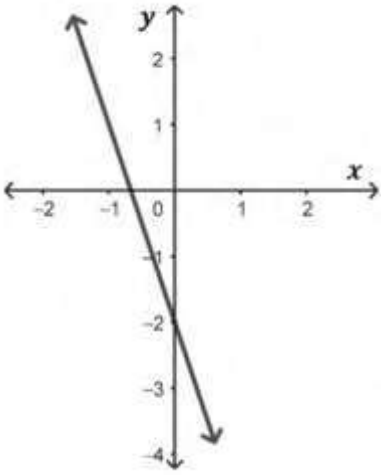
B



C



D



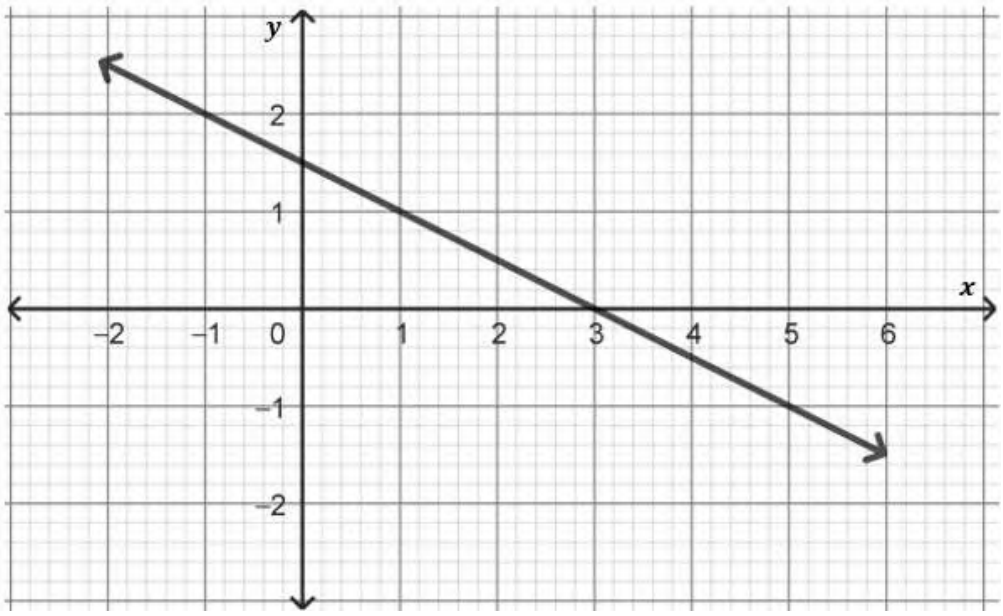
(1)

SECTION A TOTAL [60]

SECTION B

61. Simplify completely: $\dfrac{-5x(2x-4x^2)+x^2(1+16x)}{-3x}$ (3)

62. Solve for x: $2x^2-6x=(x-3)(x+3)$ (3)

63. 

Determine the equation of the line. (5)

64. Blocks are stacked in layers. There is one block in the first layer. Each layer increases by the same number of blocks. 16 blocks are used to stack 4 layers.
How many blocks are needed in total to stack ten layers? (4)

SECTION B TOTAL [15]

TOTAL [75]

End of test.

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REPUBLIC OF SOUTH AFRICA

NATIONAL ASSESSMENT

		Marks/Punte
Section/Adeling A	60	
Section/Adeling B	15	
Total/Totaal: 75		

GENERAL EDUCATION CERTIFICATE (GEC)
ALGEMENE ONDERWYSSERTIFIKAAT (AOS)

2024 ANSWER BOOKLET/ ANTWOORDBOEK

MATHEMATICS/WISKUNDE
Paper/Vraestel 1

NOR AND PFA/GBV EN PFA

Language of test/Taal van toets (✓)	
English	Afrikaans

EMIS No/Nr: | | | | | | | | | | Date/Datum: ___/__/ 2024

School/Skool: _____

Grade/Graad 9 Class/Klas: _____

Name/Naam: _____

Surname/Van: _____

Province/Provinsie: _____

Moderated Marks/Gemodereerde punte			
School/Skool	District/Distrik	Province/Provinsie	DBE (National)

Instructions to the learner:	Instruksies aan die leerder:
1. Complete the cover page in full. 2. Write neatly, legibly and answer all questions. 3. Write only the letter of the correct answer for all multiple-choice questions. 4. If you made a mistake by writing e.g. C, draw a line through the letter and write the correct letter next to the cancelled one. e.g. ~~C~~ A. 5. In Section B, show all the necessary calculations.	1. Voltooi die voorblad volledig. 2. Skryf netjies, leesbaar en beantwoord alle vrae. 3. Skryf slegs die letter neer van die korrekte antwoord vir alle meervoudige keusevrae. 4. Indien jy 'n fout begaan het, bv. C, trek 'n lyn deur die letter en skryf dan die korrekte letter langs die gekanselleerde een bv. ~~C~~ A. 5. In Afdeling B, toon al die nodige berekeninge aan.

SECTION/AFDELING A

No/Nr	Letter
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	

No/Nr	Letter
21.	
22.	
23.	
24.	
25.	
26.	
27.	
28.	
29.	
30.	
31.	
32.	
33.	
34.	
35.	
36.	
37.	
38.	
39.	
40.	

No/Nr	Letter
41.	
42.	
43.	
44.	
45.	
46.	
47.	
48.	
49.	
50.	
51.	
52.	
53.	
54.	
55.	
56.	
57.	
58.	
59.	
60.	

SECTION/AFDELING B

61.

62.

63.

64.

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GEC PILOT STUDY
MARKING GUIDELINES 2024
MATHEMATICS PAPER 1
GRADE 9

SECTION A

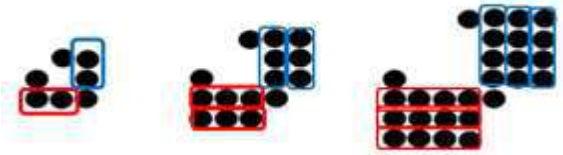
- *One mark per answer.*
- *No half marks may be allocated.*
- *Tick* (✓) only the correct answer and underline the incorrect answer.

No.		Expected answer	Key (✓)	Rational/Clarification
1.	D	$\frac{8}{0}$	✓	A number divided by zero is undefined.
2.	B	5	✓	$125 = 5 \times 5 \times 5$ $200 = 2 \times 2 \times 2 \times 5 \times 5$ $510 = 2 \times 3 \times 5 \times 17$ HCF $= 5$
3.	A	1 800	✓	$75 = 3 \times 5 \times 5$ $450 = 2 \times 3 \times 3 \times 5 \times 5$ $1800 = 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$ LCM $= 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$
4.	C	Indirect proportion.	✓	As time decreases, the speed increases with the product of time and speed remaining constant.

No.		Expected answer	Key (✓)	Rational/Clarification
5.	C	$\frac{2}{3}$ hour	✓	Speed $= \frac{d}{t}$ $= \frac{6}{24}$ $= 0{,}25$ km/h Time $= \frac{d}{s}$ $= \frac{10}{0{,}25}$ $= 40$ min $= \frac{2}{3}$ h **OR** Speed $= \frac{d}{t}$ $= \frac{6}{24 \div 60}$ $= 15$ km/h Time $= \frac{d}{s}$ $= \frac{10}{15}$ $= \frac{2}{3}$ h
6.	A	$4{,}5\ \%$	✓	$2023 - 2006 = 17$ years $A = P(1+i)^n$ $R11\,291{,}45 = R5300\left(1 + \frac{i}{100}\right)^{17}$ $\left(\sqrt[17]{\frac{11291{,}45}{5300}} - 1\right) \times 100 = i$ $4{,}5\ \% = i$
7.	C	$(-a \times e)(b \times -g)$	✓	Changing the order of factors does not change the product.
8.	B	$-\frac{1}{5}$ and 5	✓	The sum of additive inverses is zero. The product of multiplicative inverses is 1.
9.	A	22	✓	$6 - (3-5) + 9 - (-15) \div 3$ $= 6 - (-2) + 9 - (-5)$ $= 22$
10.	A	-21	✓	$\frac{5(3)(4) - 5(3 - (4) \times 3)}{-3 - 2}$ $= \frac{60 - 5(-9)}{-5}$ $= \frac{60 + 45}{-5}$ $= -21$

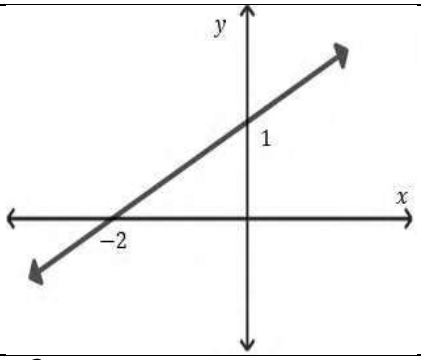
No.		Expected answer	Key (✓)	Rational/Clarification
11.	D	-1	✓	$\frac{\sqrt[3]{125}-3^2+0+1}{-4+\sqrt{121}-\sqrt[3]{64}}$ $=\frac{5-9+0+1}{-4+11-4}$ $=\frac{-3}{3}$ $=-1$
12.	A	16	✓	$\left(\frac{\sqrt[3]{27}+\sqrt{\frac{50}{2}}}{\frac{4^2-\sqrt[3]{8}}{\sqrt{49}}}\right)^2$ $=\left(\frac{3+5}{\frac{16-2}{7}}\right)^2$ $=\left(8\times\frac{7}{14}\right)^2$ $=16$
13.	A	$6n^5$	✓	$3n^3\times 2n^2$ $=3\times 2\times n^{3+2}$ $=6n^5$
14.	B	$-8x^6y^3$	✓	$(-2x^2y)^3$ $=(-2)^3(x^2)^3y^3$ $=-8x^6y^3$
15.	A	6	✓	$2^{-2}\times 6^3\times 3^{-2}$ $=2^{-2}\times(2\times 3)^3\times 3^{-2}$ $=2^{-2}\times 2^3\times 3^3\times 3^{-2}$ $=2^{-2+3}\times 3^{3-2}$ $=2^1\times 3^1$ $=6$ **OR** $\frac{1}{\cancel{4}}\times\frac{\overset{6}{\cancel{216}}}{1}\times\frac{1}{\cancel{9}}$ $=6$
16.	C	$\frac{-3}{x^2y^{11}}$	✓	$-3(x^{-1}y^2)^{-3}\times(xy)^{-5}$ $=-3x^3y^{-6}\times x^{-5}y^{-5}$ $=-3x^{3-5}y^{-6-5}$ $=-3x^{-2}y^{-11}$ $=\frac{-3}{x^2y^{11}}$

No.		Expected answer	Key (✓)	Rational/Clarification
17.	B	$\frac{y^4}{4}$	✓	$\left(\frac{y^2+\frac{1}{y^{-2}}}{y^2\times y^2}\right)^{-2}$ $\left(\frac{y^2+y^2}{y^2\times y^2}\right)^{-2}$ $=\left(\frac{2y^2}{y^{2+2}}\right)^{-2}$ $=\left(\frac{2^{-2}\times y^{-4}}{y^{-8}}\right)$ $=\frac{4^{-1}\times y^{-4}}{y^{-8}}$ $=4^{-1}\times y^{-4+8}$ $=\frac{y^4}{4}$ **OR** $\left(\frac{y^2+\frac{1}{y^{-2}}}{y^2\times y^2}\right)^{-2}$ $\left(\frac{y^2+y^2}{y^2\times y^2}\right)^{-2}$ $=\left(\frac{2y^2}{y^{2+2}}\right)^{-2}$ $=\left(\frac{y^4}{2y^2}\right)^{2}$ $=\frac{y^8}{4y^4}$ $=\frac{y^4}{4}$
18.	D	$\frac{2y^2}{x}$	✓	$\frac{\sqrt{4x^6y^{-2}}\times(x^2)^{-2}}{(2x)^0y^{-3}}$

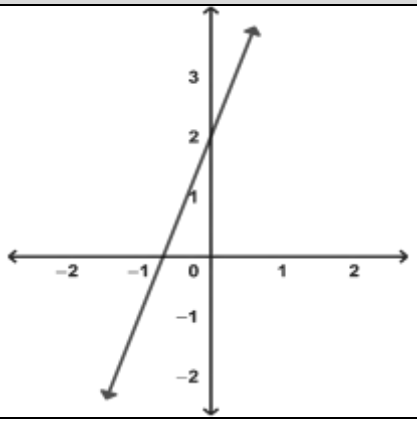
No.		Expected answer	Key (✓)	Rational/Clarification
				$= 2x^{3-4}y^{-1+3}$ $= 2x^{-1}y^2$ $= \frac{2y^2}{x}$
19.	B	Add 1 to the previous term to get the next term.	✓	$\frac{1}{2}; \underset{+1}{\frac{3}{2}}; \underset{+1}{\frac{5}{2}}; \underset{+1}{\frac{7}{2}}; \ldots$
20.	A	8; 13	✓	0; 1; 1; 2; 3; 5; 8; 13 Add the previous two terms to determine the next term. (Fibonacci)
21.	C		✓	 Pattern 1: 2 dots, 1 row, 1 column Pattern 2: 3 dots, 2 rows, 2 columns Pattern 3: 4 dots, 3 rows, 3 columns 3 anchor dots in each pattern
22.	A	$324\ \text{cm}^2$	✓	9th square's side $= 18$ cm Area $= s^2$ $= (18\ \text{cm})^2$ $= 324\ \text{cm}^2$
23.	D	$-3\text{p}q^2\text{r}$ and $5\text{p}q^2r$	✓	Like terms have the same variables with the same exponents.
24.	D	3	✓	The term with the smallest coefficient is $-2x^3$ and the exponent of x is 3.
25.	D	3	✓	Only plus and minus signs separate terms.
26.	A	$-6y^3 + 12y^2 - 1$	✓	$-3y(2y^2 - 4y) - 1$ $= -6y^3 + 12y^2 - 1$
27.	D	$5\text{y}^2 + 3\text{y} - 2$	✓	$\frac{15y^3 - 3y(-y+2) + 6y^2}{3y}$ $= \frac{15y^3 + 3y^2 - 6y + 6y^2}{3y}$ $= \frac{15y^3 + 9y^2 - 6y}{3y}$ $= 5\text{y}^2 + 3\text{y} - 2$
28.	C	$\frac{5y^4}{4}$	✓	$\sqrt{\text{y}^8 + \frac{9}{16}\text{y}^8}$

No.		Expected answer	Key (✓)	Rational/Clarification
				$= \sqrt{\frac{16y^8 + 9y^8}{16}}$ $= \sqrt{\frac{25y^8}{16}}$ $= \frac{5y^4}{4}$
29.	B	$16x^2 - 4x + \frac{1}{4}$	✓	$\left(4x - \frac{1}{2}\right)^2$ $= \left(4x - \frac{1}{2}\right)\left(4x - \frac{1}{2}\right)$ $= 16x^2 - 2x - 2x + \frac{1}{4}$ $= 16x^2 - 4x + \frac{1}{4}$
30.	C	16	✓	$\frac{9p^2 - 8q}{r}$ $= \frac{9(-1)^2 - 8\left(\frac{1}{8}\right)}{\frac{1}{2}}$ $= \frac{9 - 1}{\frac{1}{2}}$ $= 8 \times 2$ $= 16$
31.	A	$(5a - 4b)(5a + 4b)$	✓	$25a^2 - 16b^2$ $= (5a - 4b)(5a + 4b)$
32.	C	$(y - 7)(y - 4)$	✓	$y^2 - 11y + 28$ $= (y - 7)(y - 4)$
33.	B	$9(p - 2)(p + 5)$	✓	$9p^2 + 27p - 90$ $= 9(p^2 + 3p - 10)$ $= 9(p - 2)(p + 5)$
34.	C	$\frac{2(a - 2)}{a + 2}$	✓	$\frac{2a^2 - 10a + 12}{a(a + 2) - 3(a + 2)}$ $= \frac{2(a^2 - 5a + 6)}{(a + 2)(a - 3)}$ $= \frac{2(a - 2)(a - 3)}{(a + 2)(a - 3)}$ $= \frac{2(a - 2)}{a + 2}$
35.	C	$4 - p - q$	✓	$\frac{48r - 3r(p + q)^2}{12r + 3pr + 3qr}$ $= \frac{3r[16 - (p + q)^2]}{12r + 3pr + 3qr}$

No.		Expected answer	Key (✓)	Rational/Clarification
				$= \frac{3r[4-(p+q)][4+(p+q)]}{3r(4+p+q)}$ $= \frac{3r[4-p-q][4+p+q]}{3r(4+p+q)}$ $= 4-p-q$
36.	D	$\frac{1}{2}$	✓	$-2 = -4m$ $\frac{-2}{-4} = m$ $m = \frac{1}{2}$
37.	B	-14	✓	$\frac{a}{7} = -2$ $a = -14$
38.	A	$x = 4$	✓	$(x-4)^2 = 0$ $x-4=0$ $x=4$
39.	C	$x = 3$ or $x = 1$	✓	$(x-3)(1-x) = 0$ $x-3=0$ or $1-x=0$ $x=3$ or $-x=-1$ $x=1$
40.	D	$y = 2x-3$	✓	y is the selling price, x is the cost price. Selling price = double cost price minus three.
41.	A	5	✓	$4(x-1) = 16$ $x-1=4$ $x=5$
42.	C	$(1;1)$	✓	$y = x^2-1$ $1 \neq (1)^2-1$ Does NOT satisfy the equation.
43.	B	$x = 6$ or $x = -3$	✓	$x^2-3x-18=0$ $(x-6)(x+3)=0$ $x=6$ or $x=-3$
44.	B	-1	✓	$2^m + 0{,}5 = 1$ $2^m = 1-\frac{1}{2}$ $2^m = 2^{-1}$ $m=-1$
45.	A	0 or $\frac{1}{4}$	✓	$\frac{6x}{3} - x = 4x^2$ $6x-3x = 12x^2$ $12x^2-3x=0$ $3x(4x-1)=0$ $x=0$ or $x=\frac{1}{4}$

No.		Expected answer	Key (✓)	Rational/Clarification
46.	C	10 and 12 or -10 and -12	✓	Let the first even number be $2x$. $2x(2x+2)=120$ $4x^2+4x-120=0$ $4(x^2+x-30)=0$ $4(x+6)(x-5)=0$ $x=-6$ or $x=5$ Even numbers: 10 and 12 of -12 and -10
47.	B	-4	✓	<table><tr><td>Input</td><td>-1</td><td>2</td><td>5</td><td>8</td></tr><tr><td>Output</td><td>b</td><td>-1</td><td>2</td><td>5</td></tr></table> Output = Input -3 $b=-1-3$ $b=-4$
48.	C	7	✓	$y=-2x-3$ $=-2(-5)-3$ $=10-3$ $=7$
49.	D	Multiply by -3	✓	$-2(-3)=6$ $-1(-3)=3$ $2(-3)=6$ ∴ multiply by -3
50.	C		✓	The table clearly indicates the x-intercept, $(-2;\ 0)$ and the y-intercept, $(0;1)$.
51.	D	$\frac{-3}{22}$	✓	$-\frac{2a}{3}+1=-8a$ $-2a+3=-24a$ $-2a+24a=-3$ $22a=-3$ $a=\frac{-3}{22}$
52.	B	$y=-2x+4$	✓	$A(3;-2)\rightarrow A'(2;0)$ Join the points. y-intercept $=4$ Gradient $=\frac{\text{vertical change}}{\text{horizontal change}}$ $=\frac{-2-0}{3-2}$ $=-2$

No.		Expected answer	Key (✓)	Rational/Clarification
				The equation is $y = -2x + 4$.
53.	C	$(0; 3)$	✓	$y = -2x + 3$ If $x = 0$ then $y = 3$.
54.	B	$y = 3$	✓	Gradient of a horizontal line equal to zero. y-intercept of f is 3, therefore $y = 3$.
55.	D	$\frac{-3}{2}$	✓	The gradient of a line is equal to the coefficient of x in $y = mx + c$.
56.	A	$y = -x - 2$	✓	$m = \frac{y_1 - y_2}{x_1 - x_2}$ $= \frac{-3 - (-2)}{1 - 0}$ $= \frac{-1}{1}$ $= -1$ y-intercept: $(0; -2)$ c $= -2$ Substitute in $y = mx + c$ $y = -x - 2$
57.	D	$(2; 0)$ and $(0; 4)$	✓	x –intercept: $y = 0$ $4x + 2(0) = 8$ $x = 2$ $(2; 0)$ y-intercept: $x = 0$ $4(0) + 2y = 8$ $y = 4$ $(0; 4)$
58.	C	$c < 0; m > 0$	✓	The y-intercept is negative and the gradient is positive.
59.	D	$-\frac{2}{3}$	✓	Use any two of $(-2;3)$; $(4; -1)$ or $(1; 1)$. m $= \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{-1 - 3}{4 + 2}$ $= -\frac{4}{6}$ $= -\frac{2}{3}$

No.		Expected answer	Key (✓)	Rational/Clarification
60.	C		✓	$2y - 6x - 4 = 0$ $y = 3x + 2$ Standard form ∴ gradient $= 3$ and y-intercept $= 2$
				SECTION A TOTAL **[60]**

SECTION B

Marking guideline for Section B		
• Do not penalise the learner for the same mistake more than once. • *There are no half marks.* • Underline errors committed by learners do not place a cross (X). • In instances where learners have used different but mathematically sound strategies to solve problems, they (learners) must be credited. • Consistent accuracy must be applied.		
M	key	a mark for a correct method
A		a mark for accurate calculation
CA		a mark for consistent accuracy

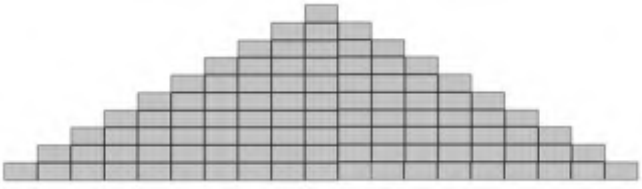
No.	Expected answer	Rational/Clarification	Mark
61.	$\frac{-5x(2x-4x^2)+x^2(1+16x)}{-3x}$ $=\frac{-10x^2+20x^3+x^2+16x^3}{-3x}$ ✓**M** $=\frac{-9x^2+36x^3}{-3x}$ ✓**CA** $=3x-12x^2$ ✓**CA** **OR** $\frac{-5x(2x-4x^2)+x^2(1+16x)}{-3x}$ $=\frac{-5x(2x-4x^2)}{-3x}+\frac{x^2(1+16x)}{-3x}$ $=\frac{-10x^2+20x^3}{-3x}+\frac{x^2+16x^3}{-3x}$ ✓**M** $=\frac{10}{3}x-\frac{20}{3}x^2-\frac{1}{3}x-\frac{16}{3}x^2$ ✓**CA** $=3x-12x^2$ ✓**CA**	Simplification: 1 mark $-9x^2+36x^3$: 1 mark Answer: 1 mark **OR** Simplification: 1 mark $\frac{10}{3}x-\frac{20}{3}x^2-\frac{1}{3}x-\frac{16}{3}x^2$: 1 mark Answer: 1 mark	(3)
62.	$2x^2-6x=(x-3)(x+3)$ $2x^2-6x=x^2-9$ ✓**M** $x^2-6x+9=0$ ✓**CA** $(x-3)^2=0$ $x=3$ ✓**CA**	x^2-9: 1 mark Standard form**:** 1 mark Answer: 1 mark	(3)

No.	Expected answer	Rational/Clarification	Mark
63.	Used $(-1;2)$ and $(5;-1)$. Any 2 applicable points may be used. ✓**M** Gradient $= \frac{2-(-1)}{-1-5}$ $= \frac{2+1}{-1-5}$ $= \frac{3}{-6}$ $= -\frac{1}{2}$ ✓**CA** $y = -\frac{1}{2}x + c$ y-intercept: Substitute any applicable point. $0 = -\frac{1}{2}(3) + c$ ✓**M** $c = 0 + \frac{3}{2}$ $= \frac{3}{2}$ *or* $1\frac{1}{2}$ ✓ **CA** $y = -\frac{1}{2}x + 1\frac{1}{2}$ ✓ **CA**	Identification of 2 points: 1 Mark Gradient calculation: 1 Mark **OR** **2 marks for the correct gradient** Substitution of gradient and point: 1 Mark Calculation of y-intercept: : 1 Mark Equation: 1 Mark	(5)

64.

Number of layers in stack	Blocks per layer	Total number of blocks.
1	1	1
2	$1+2=3$	4
3	$3+2=5$	9
4	$5+2=7$	16
5	$7+2=9$	25
6	$9+2=11$	36
7	$11+2=13$	49
8	$13+2=15$	64
9	$15+2=17$	81
10	$17+2=19$	100

OR



OR

Number of layers in stack	Total number of blocks used.
1	1
2	$1+3=4$
3	$1+3+5=9$
4	$1+3+5+7=16$
5	$1+3+5+7+9=25$
6	$1+3+5+7+9+11=36$
7	$1+3+5+7+9+11+13=49$
8	$1+3+5+7+9+11+13+15=64$
9	$1+3+5+7+9+11+13+15+17=81$
10	$1+3+5+7+9+11+13+15+17+19=100$

Number of blocks is equal to number of layers multiplied by itself. ✓**M**
Number of blocks $= y$. Number of layers $= x$
$y = x \times x$ ✓**M**
$y = 10 \times 10$ ✓**M**
$y = 100$✓**CA**

Correct number of blocks for 3 stacks: 1 mark

Correct number of blocks for next 3 stacks: 1 mark

Correct number of blocks for next 3 stacks: 1 mark

Answer: 1 mark

Maths sentence: 1 mark
Formula: 1 mark
Substitution: 1 mark
Answer: 1 mark
Full marks for correct answer only.

(4)

No.	Expected answer	Rational/Clarification	Mark
		SECTION B TOTAL	**[15]**
		TOTAL	**[75]**