



**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.  $\frac{1}{2}; \frac{3}{2}; \frac{5}{2}; \frac{7}{2}; \dots$

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;...

What are the next two terms in the sequence?

- A 8; 13
- B 7; 9
- C 6; 8
- D 7; 13

(1)

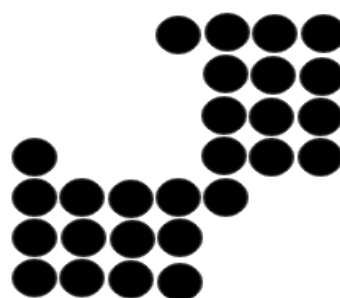
21.



PATTERN 1



PATTERN 2



PATTERN 3

Which pattern represents pattern 4?

A



B



C

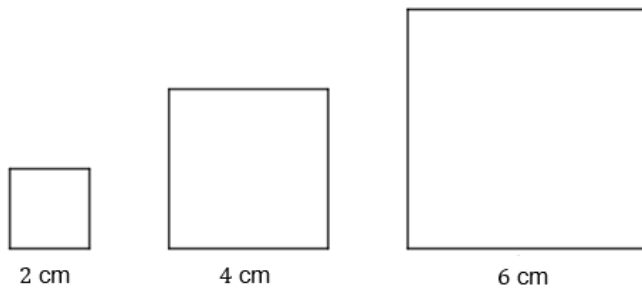


D



(1)

22. Jay makes a pattern with squares.



What will the area of the 9<sup>th</sup> square be?

- A     $324 \text{ cm}^2$   
B     $256 \text{ cm}^2$   
C     $81 \text{ cm}^2$   
D     $18 \text{ cm}^2$  (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  $11y^2 + y - 2$
- 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?

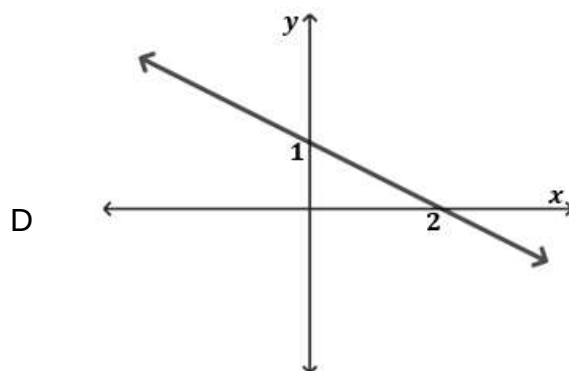
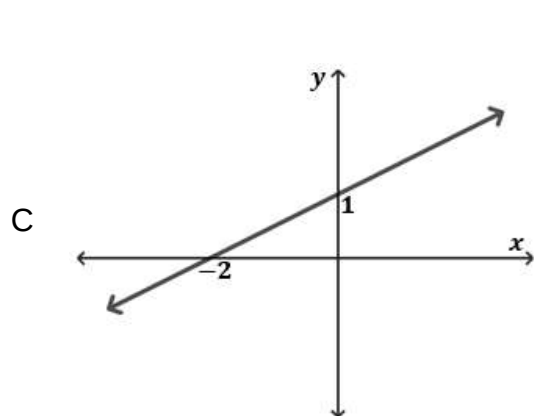
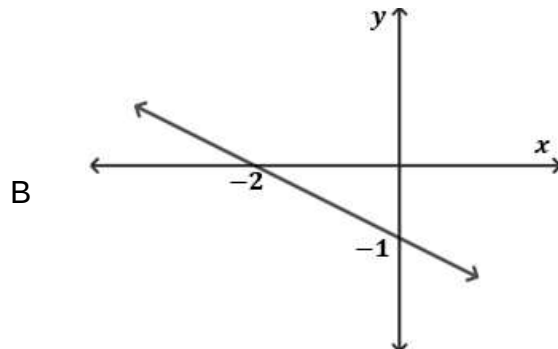
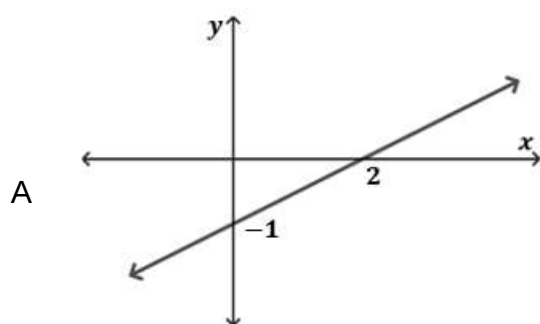
- A Multiply by  $-2$
- B Multiply by  $-1$
- C Multiply by  $-6$
- D Multiply by  $-3$

(1)

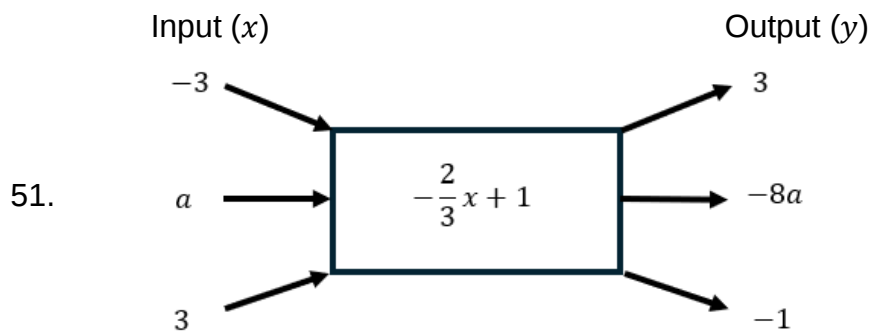
50.

|     |    |               |   |               |   |               |
|-----|----|---------------|---|---------------|---|---------------|
| $x$ | -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?



(1)



What is the value of  $a$ ?

A  $-3$

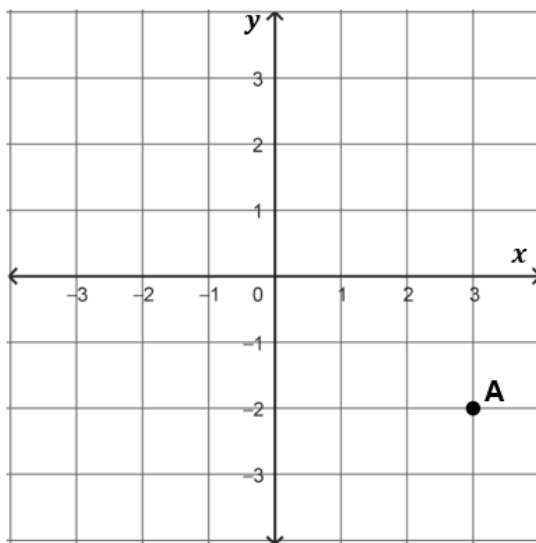
B  $3$

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)

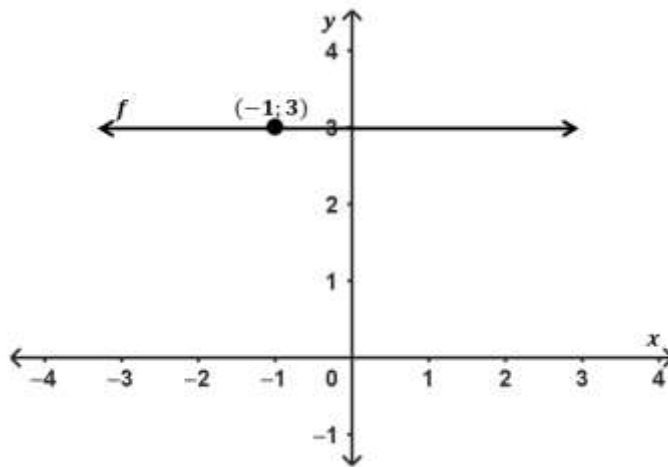
53.  $y = -2x + 3$

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  $(8;0)$

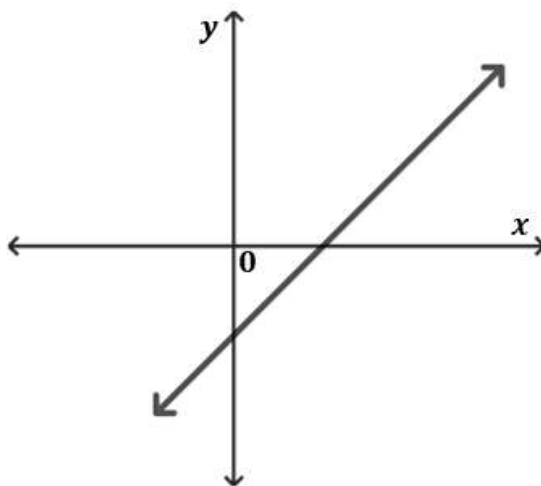
B  $(8;0)$  and  $(-2;0)$

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  $c > 0; m > 0$

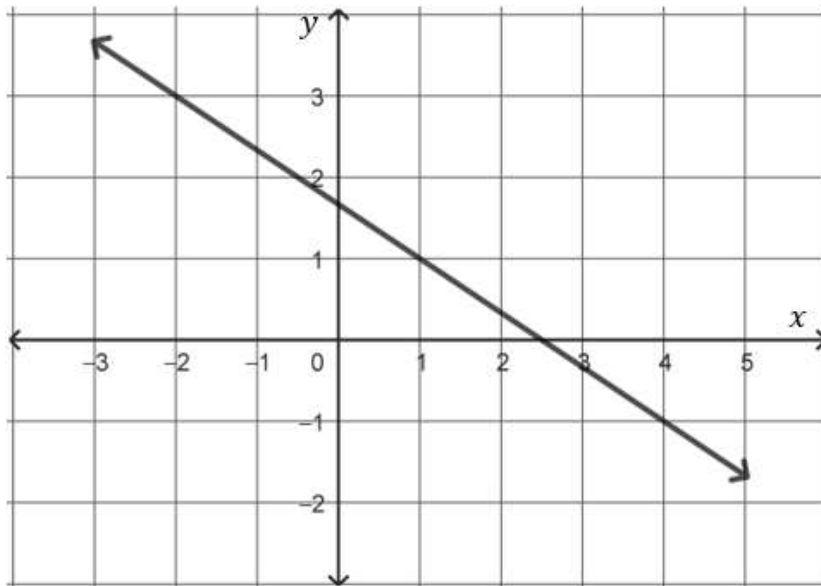
B  $c > 0; m < 0$

C  $c < 0; m > 0$

D  $c < 0; m < 0$

(1)

59.



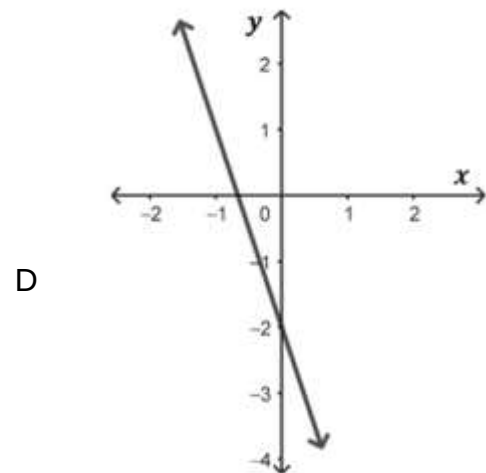
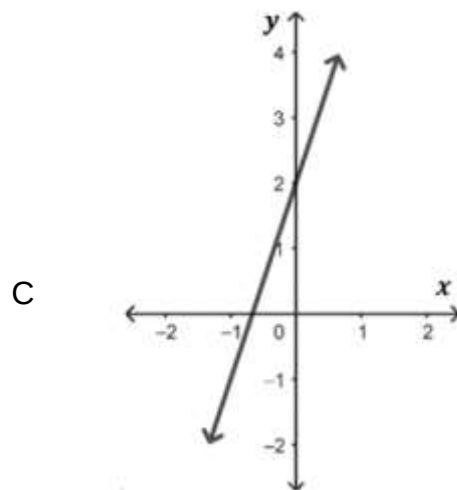
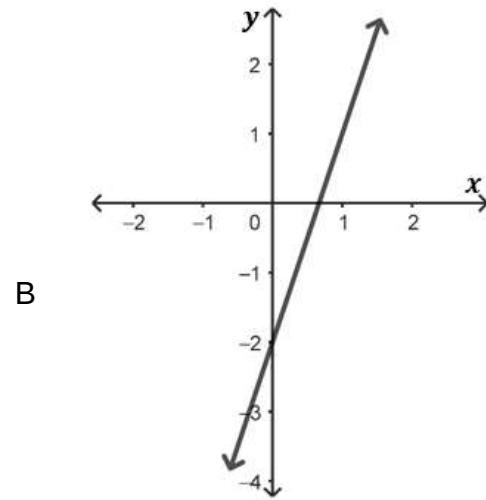
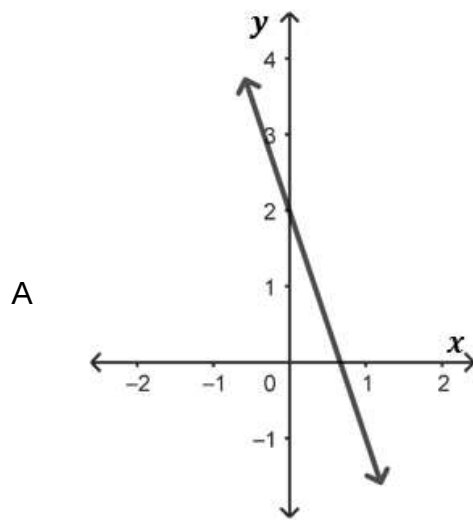
What is the gradient of the line?

- A  $\frac{3}{2}$
- B 1
- C -1
- D  $-\frac{2}{3}$

(1)

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

Which graph represents the equation?



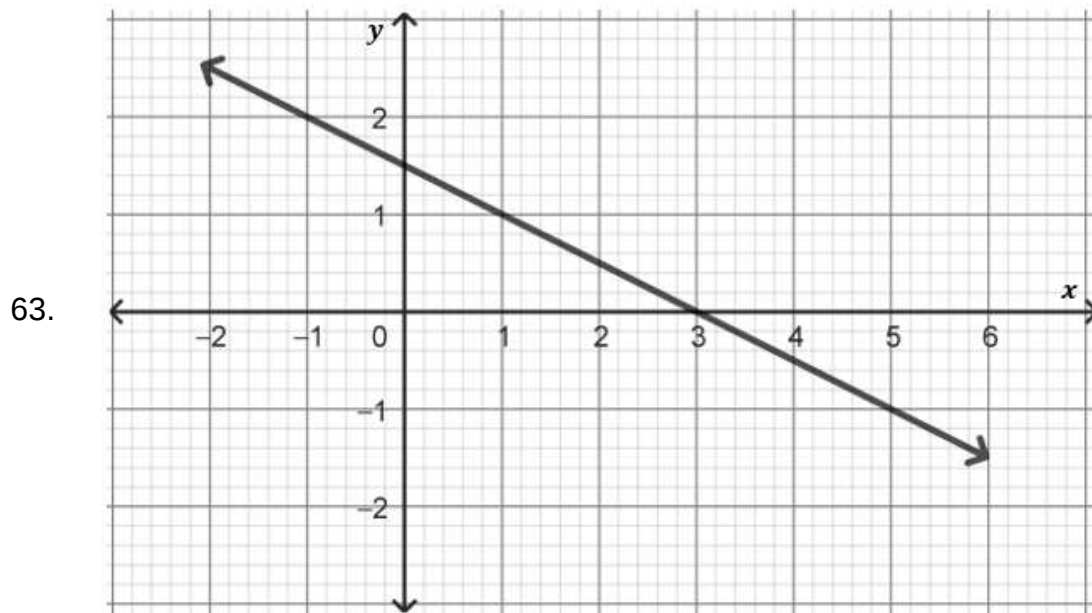
(1)

**SECTION A TOTAL [60]**

## SECTION B

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

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



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.

