ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 8

Unit 8: Geometry of Straight Lines — Exam Ready

25 multiple-choice questions Suggested time: **25 minutes** 1 mark each

Name: Date: Score: / 25

Circle one answer for each question. The answer key with explanations is on the last pages, so try every question before you check. These are practice questions, not official FBISE papers.

1. A line has a negative gradient. What does that say about it?

(A) Its inclination is between 0° and 90°
(B) It is horizontal
(C) It is vertical
(D) Its inclination is between 90° and 180°, and it falls from left to right

2. The y-intercept of the line $ax + by + c = 0$ (with $b \neq 0$) is:

(A) $-c/a$
(B) $-b/c$
(C) $-c/b$
(D) c/b

3. A(1, 1), B(2, 2) and C(3, 4) are given. Why are they not collinear?

(A) The slope of AC is zero
(B) AB = BC
(C) They form an equilateral triangle
(D) The slope of AB is 1, but the slope of BC is 2

4. The equation of the x-axis is:

(A) $x = y$
(B) $x = 0$
(C) $y = 0$
(D) $x + y = 0$

5. The relation $F = (9/5)C + 32$ converts Celsius to Fahrenheit. What does the slope 9/5 mean?

(A) At 0°C the reading is 9/5 °F
(B) The freezing point of water is 9/5 °F
(C) Each 1°C rise gives a 9/5 °F rise
(D) Each 1°F rise gives a 9/5 °C rise

6. Two lines with different slopes meet at:

(A) exactly one point
(B) infinitely many points
(C) two points
(D) no point

7. The inclination of a horizontal line is:

(A) 180°
(B) 0°
(C) 45°
(D) 90°

8. What is true about the line through (2, 5) and (2, 9)?

(A) Its gradient is 4
(B) It is horizontal, and its gradient is 0
(C) It passes through the origin
(D) It is vertical, and its gradient is undefined

9. The line y = b lies above the x-axis when:

(A) b > 0
(B) b < 0
(C) b ≠ 0
(D) b = 0

10. Which equation represents a line passing through the origin?

(A) y = 3x + 1
(B) y = 3x
(C) x = 3
(D) y = 3

11. Find the angle from the line of slope 0 to the line of slope √3.

(A) 30°
(B) 45°
(C) 60°
(D) 90°

12. Find the slope of the line 3x − 4y + 8 = 0.

(A) 8/3
(B) 4/3
(C) −3/4
(D) 3/4

13. Why does 5x − 6 = 0 represent a vertical line?

(A) It has no x term
(B) Its y-intercept is −6
(C) Its slope is 5
(D) It has no y term, so x = 6/5 is constant for every point

14. The line 3x + ky − 11 = 0 passes through (1, 2). Find k.

(A) 4
(B) −4
(C) 7
(D) 2

15. Two different lines have equal slopes. What can you say about them?

(A) They are the same line
(B) They intersect at one point
(C) They are parallel and never meet
(D) They are perpendicular

16. Lines with slopes 1 and −1 are:

(A) not related
(B) the same line
(C) parallel, since both have size 1
(D) perpendicular, since their product is −1

17. The gradient m of a line with inclination θ is:

(A) sin θ
(B) tan θ
(C) cos θ
(D) 1/tan θ

18. A student finds the gradient of the line through (1, 2) and (3, 6) as (1 − 3)/(6 − 2). What is the mistake?

(A) There is no mistake
(B) The x-differences and y-differences must be taken in the same order. The gradient is 2
(C) The gradient should be −2
(D) The gradient should be 4

19. Why is the sign of the radical in the normal form chosen so that the right-hand side is positive?

(A) Because p is a distance from the origin and cannot be negative
(B) Because the slope must be positive
(C) Because a and b must be positive
(D) Because the equation would have no solution otherwise

20. A meter shows 50 units today, and 12 units are used per day. After how many days will it show 410 units?

(A) 30
(B) 20
(C) 5
(D) 34

21. Why must a and b not both be zero in ax + by + c = 0?

(A) Because the slope would be 1
(B) Because c would be undefined
(C) Otherwise there is no x or y term, so it is not a line
(D) Because the line would pass through the origin

22. If a line has slope m (m ≠ 0), the slope of a perpendicular line is:

(A) m
(B) −1/m
(C) −m
(D) 1/m

23. A line has x-intercept double its y-intercept b. Which is its equation in two-intercept form?

(A) x/b + y/(2b) = 1
(B) x/(2b) + y/b = 1
(C) x/b + y/b = 2
(D) 2x/b + y/b = 1

24. Find the equation of the line through (2, −1) and (5, 8).

(A) 3x − y − 7 = 0
(B) 3x + y − 5 = 0
(C) x − 3y − 5 = 0
(D) 3x − y + 7 = 0

25. The x-intercept of the line ax + by + c = 0 (with a ≠ 0) is:

(A) −c/a
(B) c/a
(C) −a/c
(D) −c/b

Answer key

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1 D	**2** C	**3** D	**4** C	**5** C
6 A	**7** B	**8** D	**9** A	**10** B
11 C	**12** D	**13** D	**14** A	**15** C
16 D	**17** B	**18** B	**19** A	**20** A
21 C	**22** B	**23** B	**24** A	**25** A

Explanations

1. D. Its inclination is between 90° and 180°, and it falls from left to right
tan θ is negative for 90° < θ < 180°.

2. C. −c/b
Putting x = 0 gives by + c = 0, so y = −c/b.

3. D. The slope of AB is 1, but the slope of BC is 2
Collinear points need equal slopes between each pair.

4. C. y = 0
Every point on the x-axis has y-coordinate 0.

5. C. Each 1°C rise gives a 9/5 °F rise
The slope is the change in F per unit change in C.

6. A. exactly one point
Non-parallel lines intersect at one and only one point.

7. B. 0°
A horizontal line is parallel to the x-axis, so θ = 0°.

8. D. It is vertical, and its gradient is undefined
Both points have the same x-coordinate, so the run is 0.

9. A. b > 0
For b > 0 every point on the line has a positive y-coordinate.

10. B. y = 3x
Only y = 3x has no constant term, so (0, 0) satisfies it.

11. C. 60°
tan θ = (√3 − 0)/(1 + 0) = √3, so θ = 60°.

12. D. 3/4
Slope = −a/b = −3/(−4) = 3/4.

13. D. It has no y term, so x = 6/5 is constant for every point
b = 0 in ax + by + c = 0, so x = −c/a. That is a line parallel to the y-axis.

14. A. 4
Substituting gives 3 + 2k − 11 = 0, so 2k = 8 and k = 4.

15. C. They are parallel and never meet
Equal slopes mean equal inclination, so the lines are parallel.

16. **D. perpendicular, since their product is −1**
1 × (−1) = −1, so the angle between them is 90°.

17. **B. tan θ**
The gradient is the tangent of the inclination.

18. **B. The x-differences and y-differences must be taken in the same order. The gradient is 2**
(6 − 2)/(3 − 1) = 2. The student reversed the order in the numerator only.

19. **A. Because p is a distance from the origin and cannot be negative**
In x cos α + y sin α = p, p is the length of the perpendicular from the origin.

20. **A. 30**
50 + 12d = 410, so 12d = 360 and d = 30.

21. **C. Otherwise there is no x or y term, so it is not a line**
If a = b = 0, the equation becomes c = 0, which does not describe a line.

22. **B. −1/m**
The product of the two slopes must be −1.

23. **B. x/(2b) + y/b = 1**
The x-intercept is a = 2b, so x/a + y/b = 1 becomes x/(2b) + y/b = 1.

24. **A. 3x − y − 7 = 0**
Slope = 9/3 = 3. y + 1 = 3(x − 2) gives y = 3x − 7.

25. **A. −c/a**
Putting y = 0 gives ax + c = 0, so x = −c/a.

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