ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 7

Unit 7: Coordinate Geometry — Advanced Practice

20 multiple-choice questions Suggested time: **20 minutes** 1 mark each

Name: Date: Score: / 20

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. The abscissa of every point on the y-axis is:

(A) undefined
(B) 1
(C) y
(D) 0

2. The distance between (1, 2) and (4, k) is 5, and k > 2. Find k.

(A) 6
(B) −2
(C) 5
(D) 4

3. The x-coordinate of the mid-point of a segment is the ___ of the x-coordinates of its end points.

(A) product
(B) sum
(C) difference
(D) average

4. If two line segments bisect each other, then:

(A) they must be perpendicular
(B) they have the same mid-point
(C) they must be equal in length
(D) they cannot meet

5. Why do the diagonals of a parallelogram have the same mid-point?

(A) The diagonals are parallel
(B) The diagonals are always equal
(C) The diagonals of a parallelogram bisect each other
(D) The diagonals are always perpendicular

6. Three points have AB = 3, BC = 4 and AC = 5. What does this show?

(A) They form an equilateral triangle
(B) They form a right-angled triangle and are not collinear, because $3 + 4 \neq 5$
(C) They form a straight line
(D) They are collinear, because 3 + 4 > 5

7. A quadrilateral with all four sides equal is called a:

(A) trapezium
(B) rectangle
(C) kite
(D) rhombus

8. M(2, 3) is the mid-point of A(−1, 5) and B(x, y). Find B.

(A) (−4, 1)
(B) (3, −2)
(C) (5, 1)
(D) (0.5, 4)

9. The distance between the points (x_1, y_1) and (x_2, y_2) is given by:

(A) $|x_2 - x_1| + |y_2 - y_1|$
(B) $(x_2 - x_1)^2 + (y_2 - y_1)^2$
(C) $\sqrt{((x_2 - x_1)^2 + (y_2 - y_1)^2)}$
(D) $\sqrt{((x_2 + x_1)^2 + (y_2 + y_1)^2)}$

10. The minimum number of sides of a polygon is:

(A) 3
(B) 1
(C) 2
(D) 4

11. A student finds the distance between (1, 2) and (4, 6) as (4 − 1) + (6 − 2) = 7. What is wrong?

(A) The coordinates should be added
(B) The horizontal and vertical distances should not just be added. The correct distance is √(9 + 16) = 5
(C) Nothing, 7 is correct
(D) The differences should be multiplied

12. When the mid-points of two sides of a triangle are joined, the segment formed is:

(A) perpendicular to the third side
(B) half the length of the third side
(C) twice the third side
(D) equal to the third side

13. Why can either point be used as (x_1, y_1) in the distance formula?

(A) Because the origin lies between them
(B) The differences are squared, so $(x_2 - x_1)^2 = (x_1 - x_2)^2$
(C) Because the points are collinear
(D) Because the coordinates are positive

14. A point P(x, y) lies in the third quadrant and is equally far from both axes. Which statement is true?

(A) $x = -y$
(B) $x = 0$
(C) $x = y$ and both are positive
(D) $x = y$ and both are negative

15. A parallelogram has two equal diagonals. What kind of parallelogram is it?

(A) Kite
(B) Trapezium
(C) Rectangle
(D) Rhombus

16. Find the distance between the points (2, −1) and (14, 4).

(A) 169
(B) 7
(C) 17
(D) 13

17. Three points A, B and C are not collinear and AB = BC. The triangle ABC is:

(A) isosceles
(B) scalene
(C) equilateral
(D) right-angled

18. For three points, AB = √5, BC = √5 and AC = 2√5. What follows?

(A) They are collinear, since √5 + √5 = 2√5
(B) They form an isosceles triangle that is not degenerate
(C) They form a right-angled triangle
(D) They form an equilateral triangle

19. A triangle has vertices (0, 0), (4, 0) and (2, 3). What kind of triangle is it?

(A) Right-angled
(B) Scalene
(C) Isosceles but not right-angled
(D) Equilateral

20. Why does the distance formula add the squares of the differences?

(A) It comes from Pythagoras theorem on the right-angled triangle formed by the horizontal and vertical distances
(B) Because points are squared first
(C) Because squares make the answer negative
(D) Because every distance must be squared

Answer key

Unit 7 · Advanced Practice

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

Explanations

1. D. 0
Points on the y-axis have x = 0.

2. A. 6
$9 + (k - 2)^2 = 25$, so $k - 2 = \pm 4$. Since k > 2, k = 6.

3. D. average
The mid-point formula takes the average of each pair of coordinates.

4. B. they have the same mid-point
Bisecting means each segment is cut into two equal parts at the same point, which is the mid-point of both.

5. C. The diagonals of a parallelogram bisect each other
Bisecting each other means both diagonals are cut at the same point.

6. B. They form a right-angled triangle and are not collinear, because 3 + 4 ≠ 5
$3^2 + 4^2 = 5^2$, so the triangle is right-angled. The points are not collinear because 3 + 4 ≠ 5.

7. D. rhombus
A rhombus has four equal sides.

8. C. (5, 1)
$(-1 + x)/2 = 2$ gives x = 5. $(5 + y)/2 = 3$ gives y = 1.

9. C. $\sqrt{((x_2 - x_1)^2 + (y_2 - y_1)^2)}$
The distance formula is the square root of the sum of the squared horizontal and vertical differences.

10. A. 3
A polygon is a closed figure made of straight segments, and the smallest one is a triangle.

11. B. The horizontal and vertical distances should not just be added. The correct distance is $\sqrt{(9 + 16)} = 5$
The straight-line distance is the hypotenuse: $\sqrt{(3^2 + 4^2)} = 5$, not 3 + 4.

12. B. half the length of the third side
This is the mid-point theorem. It can be checked with the distance formula.

13. B. The differences are squared, so $(x_2 - x_1)^2 = (x_1 - x_2)^2$
A square removes the sign, so reversing the points gives the same result.

14. D. x = y and both are negative
Equal distances from the axes give |x| = |y|. In the third quadrant both coordinates are negative, so x = y.

15. C. Rectangle
A parallelogram with equal diagonals is a rectangle.

16. **D. 13**

$d = \sqrt{((14 - 2)^2 + (4 - (-1))^2)} = \sqrt{(144 + 25)} = \sqrt{169} = 13$.

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17. **A. isosceles**

Two equal sides make the triangle isosceles.

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18. **A. They are collinear, since $\sqrt{5} + \sqrt{5} = 2\sqrt{5}$**

AB + BC = AC means B lies on the segment AC, so the three points are on one line.

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19. **C. Isosceles but not right-angled**

Sides: 4, $\sqrt{13}$ and $\sqrt{13}$. Two sides are equal, and $4^2 = 16 \neq 13 + 13$, so it is not right-angled.

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20. **A. It comes from Pythagoras theorem on the right-angled triangle formed by the horizontal and vertical distances**

The two differences are the legs of a right-angled triangle and the distance is its hypotenuse.

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