ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 6

Unit 6: Trigonometry and Bearing — 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. Convert 60°30′ into decimal degrees.

(A) 60.3°
(B) 60.30°
(C) 60.05°
(D) 60.5°

2. In which quadrant is tan θ positive but sin θ negative?

(A) Second quadrant
(B) First quadrant
(C) Fourth quadrant
(D) Third quadrant

3. Evaluate sin 60° cos 30° − cos 60° sin 30°.

(A) √3/2
(B) 0
(C) 1
(D) 1/2

4. If one acute angle of a right-angled triangle is θ, the other acute angle is:

(A) θ
(B) 90° − θ
(C) 90° + θ
(D) 180° − θ

5. A person walks 5 km north and then 5 km east. What is the bearing of the end point from the start?

(A) 315°
(B) 135°
(C) 045°
(D) 090°

6. The value of tan 60° is:

(A) 1/√3
(B) 1
(C) √3/2
(D) √3

7. An angle whose terminal ray lies along a coordinate axis is called a:

(A) complementary angle
(B) co-terminal angle
(C) quadrantal angle
(D) reflex angle

8. Putting θ = 2π in the formula l = rθ gives:

(A) the circumference 2πr
(B) the radius
(C) the diameter
(D) the area πr^2

9. Which of these is NOT a quadrantal angle?

(A) 360°
(B) 0°
(C) 45°
(D) 180°

10. Two angles in standard position have the same terminal ray. What is true about their measures?

(A) They add up to 90°
(B) They differ by a multiple of 360°
(C) They differ by 90°
(D) They are equal

11. Convert $2\pi/5$ radians to degrees.

(A) 36°
(B) 108°
(C) 72°
(D) 144°

12. The angle of elevation of an object is measured between:

(A) the vertical line and the line of sight
(B) the ground and the vertical
(C) the horizontal line and the line of sight upward
(D) the line of sight and the vertical

13. What is the bearing of the north-west direction?

(A) 315°
(B) 45°
(C) 225°
(D) 270°

14. How many seconds are there in one degree?

(A) 360″
(B) 3600″
(C) 100″
(D) 60″

15. On the unit circle, the point P at angle θ from the positive x-axis has coordinates:

(A) (cos θ, sin θ)
(B) (sin θ, cos θ)
(C) (1, θ)
(D) (tan θ, cot θ)

16. What happens to the terminal ray when an angle is increased by 360°?

(A) It reverses direction
(B) It moves to the y-axis
(C) It disappears
(D) It returns to the same position

17. Which statement about bearings is correct?

(A) They are measured clockwise from north
(B) They are measured anticlockwise from north
(C) They are measured clockwise from east
(D) They are measured anticlockwise from east

18. Why is cosec 0° undefined?

(A) tan 0° = 1
(B) sin 0° = 0, and division by zero is impossible
(C) cos 0° = 0
(D) cosec is defined for no angle

19. A kite string 50 m long makes an angle of 30° with the horizontal ground. How high is the kite?

(A) 100 m
(B) $25\sqrt{3}$ m
(C) 50 m
(D) 25 m

20. Dividing $\sin^2\theta + \cos^2\theta = 1$ by $\cos^2\theta$ gives which identity?

(A) $1 + \cot^2\theta = \operatorname{cosec}^2\theta$
(B) $\tan\theta = 1$
(C) $\tan^2\theta + 1 = \sec^2\theta$
(D) $\sin\theta + \cos\theta = \sec\theta$

21. The equation of a unit circle with centre at the origin is:

(A) $x^2 + y^2 = 1$
(B) $x^2 + y^2 = 0$
(C) $x + y = 1$
(D) $x^2 - y^2 = 1$

22. The value of cos 180° is:

(A) 1
(B) −1
(C) undefined
(D) 0

23. The value of sin 45° is:

(A) $1/\sqrt{2}$
(B) $\sqrt{3}/2$
(C) 1
(D) 1/2

24. If the bearing of B from A is 120°, where is B from A?

(A) Between north and west
(B) Between east and south
(C) Between north and east
(D) Between south and west

25. Which pair of angles is co-terminal?

(A) 60° and −300°
(B) 60° and 120°
(C) 60° and 240°
(D) 60° and 300°

Answer key

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

Explanations

1. D. 60.5°
30′ = 30/60 = 0.5°, so 60°30′ = 60.5°.

2. D. Third quadrant
In quadrant III both x and y are negative, so tan θ = y/x is positive and sin θ is negative.

3. D. 1/2
(√3/2)(√3/2) − (1/2)(1/2) = 3/4 − 1/4 = 1/2.

4. B. 90° − θ
The three angles add up to 180°, and one is 90°.

5. C. 045°
tan θ = 5/5 = 1, so the direction is 45° east of north: 045°.

6. D. √3
tan 60° = sin 60° / cos 60° = (√3/2) ÷ (1/2) = √3.

7. C. quadrantal angle
Angles 0°, 90°, 180°, 270°, 360° … are quadrantal angles.

8. A. the circumference 2πr
A full turn gives l = r × 2π = 2πr, the circumference.

9. C. 45°
Quadrantal angles are multiples of 90°. 45° is not.

10. B. They differ by a multiple of 360°
Co-terminal angles differ by a whole number of full turns.

11. C. 72°
2π/5 × 180/π = 72°.

12. C. the horizontal line and the line of sight upward
The angle of elevation is measured from the horizontal up to the line of sight.

13. A. 315°
North is 000°, west is 270°, so north-west is halfway: 315°.

14. B. 3600″
1° = 60′ and 1′ = 60″, so 1° = 3600″.

15. A. (cos θ, sin θ)
x = cos θ and y = sin θ.

16. **D. It returns to the same position**
360° is one complete turn, so the ray lands where it began.

17. **A. They are measured clockwise from north**
A bearing is the clockwise angle from north, written with three digits.

18. **B. sin 0° = 0, and division by zero is impossible**
cosec θ = 1/sin θ, and sin 0° = 0.

19. **D. 25 m**
height = 50 × sin 30° = 50 × 1/2 = 25 m.

20. **C. $\tan^2\theta + 1 = \sec^2\theta$**
$\sin^2\theta/\cos^2\theta + 1 = 1/\cos^2\theta$ gives $\tan^2\theta + 1 = \sec^2\theta$.

21. **A. $x^2 + y^2 = 1$**
Every point is 1 unit from the origin, so $x^2 + y^2 = 1$.

22. **B. −1**
The point on the unit circle at 180° is (−1, 0), so cos 180° = −1.

23. **A. $1/\sqrt{2}$**
On the unit circle, the point at 45° is $(1/\sqrt{2}, 1/\sqrt{2})$.

24. **B. Between east and south**
120° lies between 090° (east) and 180° (south).

25. **A. 60° and −300°**
60° − (−300°) = 360°, a full turn.

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