MATHEMATICS MCQ BOOKLET

Grade 10 · Chapter 8 · Application of Trigonometry

FBISE / National Book Foundation Model Textbook companion

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Independent MCQs on trigonometry for obtuse angles, solving right and oblique triangles, laws of sines and cosines, area formulas, half-angle identities, 3D applications, and angle of elevation problems. Not copied from the book exercise. Total: 108 questions. Each item has four options, the correct letter, and a short explanation of why it is correct.

A. Important / Main Topics

1. The reference angle for 150° is:

(A) 30°
(B) 150°
(C) 60°
(D) 180°

Correct Answer: A

Explanation: The reference angle for 150° is 30°.

2. sin 150° equals:

(A) −1/2
(B) 1/2
(C) √3/2
(D) −√3/2

Correct Answer: B

Explanation: sin(180° − 30°) = sin 30° = 1/2, so the correct choice is 1/2.

3. cos 150° equals:

(A) √3/2
(B) 1/2
(C) −√3/2
(D) −1/2

Correct Answer: C

Explanation: cos is negative in quadrant II: −cos 30° = −√3/2.

4. tan 150° equals:

(A) 1/√3
(B) √3
(C) −√3
(D) −1/√3

Correct Answer: D

Explanation: tan 150° = −tan 30° = −1/√3, so the correct choice is −1/√3.

5. The reference angle for 125° is:

(A) 55°
(B) 125°
(C) 65°
(D) 35°

Correct Answer: A

Explanation: 180° − 125° = 55°, so the correct choice is 55°.

6. sin 120° equals:

(A) −√3/2
(B) √3/2
(C) 1/2

(D) −1/2

Correct Answer: B

Explanation: sin(180° − 60°) = sin 60° = √3/2, so the correct choice is √3/2.

7. cos 120° equals:

(A) 1/2
(B) √3/2
(C) −1/2
(D) −√3/2

Correct Answer: C

Explanation: cos 120° = −cos 60° = −1/2, so the correct choice is −1/2.

8. For angle 3π/4 radians, sin equals:

(A) −1/√2
(B) √3/2
(C) −1/2
(D) 1/√2

Correct Answer: D

Explanation: 3π/4 is 135° in quadrant II; sin is positive: √2/2.

9. For angle 3π/4 radians, cos equals:

(A) −1/√2
(B) 1/√2
(C) −√3/2
(D) 1/2

Correct Answer: A

Explanation: cos 135° is negative: −√2/2, so the correct choice is −1/√2.

10. If cos θ = 0.559 for acute θ, then cos(180° − θ) equals:

(A) 0.559
(B) −0.559
(C) 0
(D) 1

Correct Answer: B

Explanation: If cos θ = 0.559 for acute θ, then cos(180° − θ) equals −0.559.

11. If cos θ = 0.559 for acute θ, then sin(180° − θ) equals:

(A) −sin θ
(B) 0.559
(C) sin θ
(D) 1

Correct Answer: C

Explanation: sin(180° − θ) = sin θ for supplementary pairs.

12. A right triangle has:

(A) three acute angles
(B) no angles
(C) all angles equal
(D) one 90° angle

Correct Answer: D

Explanation: Right means one angle is exactly 90°, so the correct choice is one 90° angle.

13. In triangle ABC with right angle at C, side c is:

(A) the hypotenuse
(B) opposite C
(C) always shortest

(D) adjacent to A only

Correct Answer: A

Explanation: Side opposite the right angle is the hypotenuse c.

14. A right triangle can be solved when given:

(A) no information
(B) two sides, or one side and one acute angle
(C) only the colour of vertices
(D) four sides

Correct Answer: B

Explanation: A right triangle can be solved when given two sides, or one side and one acute angle.

15. In right triangle with angle A = 40° and hypotenuse c = 15 m, side a equals:

(A) 15 cos 40°
(B) 15 tan 40°
(C) 15 sin 40°
(D) 15/40

Correct Answer: C

Explanation: Side a is opposite A, so a = c sin A, so the correct choice is 15 sin 40°.

16. In the same triangle, side b equals:

(A) 15 sin 40°
(B) 15 tan 40°
(C) 40 m
(D) 15 cos 40°

Correct Answer: D

Explanation: Side b is adjacent to A, so b = c cos A.

17. If b = 50 m and angle B = 35.5° in a right triangle at C, hypotenuse c equals:

(A) 50/sin 35.5°
(B) 50 sin 35.5°
(C) 50 cos 35.5°
(D) 50 tan 35.5°

Correct Answer: A

Explanation: sin B = b/c, so c = b/sin B = 50/sin 35.5°.

18. If b = 15 cm and a = 12.5 cm in a right triangle at C, hypotenuse c equals:

(A) 27.5 cm
(B) $\sqrt{(15^2 + 12.5^2)}$ cm
(C) 19.5 cm
(D) 3.5 cm

Correct Answer: B

Explanation: If b = 15 cm and a = 12.5 cm in a right triangle at C, hypotenuse c equals $\sqrt{(15^2 + 12.5^2)}$ cm.

19. The law of sines states a/sin α equals:

(A) b sin α
(B) sin α/b
(C) b/sin β
(D) a + b

Correct Answer: C

Explanation: a/sin α = b/sin β = c/sin γ for any triangle.

20. The law of cosines $c^2 = a^2 + b^2 - 2ab \cos \gamma$ reduces to $c^2 = a^2 + b^2$ when γ is:

(A) 0°
(B) 180°
(C) 45°

(D) 90°

Correct Answer: D

Explanation: cos 90° = 0, giving Pythagoras as a special case.

21. Law of cosines is used when given:

(A) SAS or SSS
(B) three angles only
(C) no sides
(D) only the perimeter

Correct Answer: A

Explanation: Law of cosines is used when given SAS or SSS.

22. Law of sines is convenient for:

(A) three sides only always
(B) SSA, AAS, or ASA cases
(C) no angles
(D) circles only

Correct Answer: B

Explanation: Sine law uses angle–side pairs, so the correct choice is SSA, AAS, or ASA cases.

23. In triangle with a = 25 cm, α = 66°51′, γ = 44°12′, angle β equals:

(A) 90°
(B) 44°12′
(C) 68°57′
(D) 111°

Correct Answer: C

Explanation: β = 180° − 66°51′ − 44°12′ = 68°57′, so the correct choice is 68°57′.

24. For SSA with acute α and a < b sin α, the number of triangles is:

(A) two
(B) one
(C) infinite
(D) none

Correct Answer: D

Explanation: For SSA with acute α and a < b sin α, the number of triangles is none.

25. For SSA with acute α and h < a < b, the number of triangles is:

(A) two
(B) none
(C) one
(D) four

Correct Answer: A

Explanation: Ambiguous case: two possible angles β, so the correct choice is two.

26. For SSA with acute α and a > b, the number of triangles is:

(A) two
(B) one
(C) none
(D) three

Correct Answer: B

Explanation: For SSA with acute α and a > b, the number of triangles is one.

27. Area of triangle ABC with sides a, b and included angle γ is:

(A) ab cos γ
(B) ab sin γ
(C) (1/2) ab sin γ

(D) (1/2) ab cos γ

Correct Answer: C

Explanation: Standard area formula uses half the product of two sides times sine of included angle.

28. If a = 16.5, α = 40.5°, β = 65°, then γ equals:

(A) 105.5°
(B) 90°
(C) 65°
(D) 74.5°

Correct Answer: D

Explanation: γ = 180° − 40.5° − 65° = 74.5°, so the correct choice is 74.5°.

29. Area formula Δ = (1/2) a² sin β sin γ / sin α uses:

(A) law of sines substitution
(B) only Pythagoras
(C) no angles
(D) Heron's law only

Correct Answer: A

Explanation: Area formula Δ = (1/2) a² sin β sin γ / sin α uses law of sines substitution.

30. Heron's formula uses S defined as:

(A) a + b + c
(B) (a + b + c)/2
(C) abc
(D) a² + b² + c²

Correct Answer: B

Explanation: S is the semi-perimeter (a + b + c)/2, so the correct choice is (a + b + c)/2.

31. Heron's formula for area is:

(A) S(S − a)(S − b)(S − c)
(B) S + a + b + c
(C) √[S(S − a)(S − b)(S − c)]
(D) 2S

Correct Answer: C

Explanation: Area = √[S(S − a)(S − b)(S − c)], so the correct choice is √[S(S − a)(S − b)(S − c)].

32. The in-radius r of a triangle equals:

(A) S/Δ
(B) Δ × S
(C) a + b + c
(D) Δ/S

Correct Answer: D

Explanation: Area Δ = rS, so r = Δ/S, so the correct choice is Δ/S.

33. An ex-radius r□ opposite side a equals:

(A) Δ/(S − a)
(B) Δ/S
(C) S − a
(D) Δ × a

Correct Answer: A

Explanation: Excircle touching side a uses r□ = Δ/(S − a).

34. sin(α/2) in terms of sides uses:

(A) √[S(S − a)/(bc)]
(B) √[(S − b)(S − c)/(bc)]
(C) S − a

(D) bc/S

Correct Answer: B

Explanation: sin(α/2) in terms of sides uses √[(S − b)(S − c)/(bc)].

35. cos(α/2) in terms of sides uses:

(A) √[(S − b)(S − c)/(bc)]
(B) S/bc
(C) √[S(S − a)/(bc)]
(D) (S − a)/2

Correct Answer: C

Explanation: Half-angle cosine: √[S(S − a)/(bc)], so the correct choice is √[S(S − a)/(bc)].

36. Angle of elevation is measured from:

(A) vertical down to object
(B) the object to the ground
(C) north only
(D) horizontal up to object

Correct Answer: D

Explanation: Elevation is the angle above the horizontal line of sight.

37. To find building height h with angle of elevation θ and ground distance d, use:

(A) h = d tan θ
(B) h = d cos θ
(C) h = d sin θ
(D) h = d/θ

Correct Answer: A

Explanation: In the right triangle, tan θ = h/d, so the correct choice is h = d tan θ.

38. If angle of elevation is 70° and string length is 65 m, height ≈:

(A) 65 cos 70° m
(B) 65 sin 70° m
(C) 65 tan 70° m
(D) 65 m

Correct Answer: B

Explanation: Height is opposite the elevation angle with hypotenuse the string: 65 sin 70°.

39. Two boats see a lighthouse at elevations 25° and 50° with height 1500 m. Distance XU uses:

(A) sin 25° = XU/1500
(B) cos 25° = 1500/XU
(C) tan 25° = 1500/XU
(D) tan 25° = XU/1500

Correct Answer: C

Explanation: tan 25° = opposite/adjacent = 1500/XU, so the correct choice is tan 25° = 1500/XU.

40. In right triangle, tan A =:

(A) adjacent/opposite
(B) hypotenuse/opposite
(C) opposite/hypotenuse
(D) opposite/adjacent

Correct Answer: D

Explanation: Tangent is opposite over adjacent for angle A.

41. In right triangle, sin A =:

(A) opposite/hypotenuse
(B) adjacent/hypotenuse
(C) opposite/adjacent

(D) hypotenuse/opposite

Correct Answer: A

Explanation: Sine is opposite side over hypotenuse, so the correct choice is opposite/hypotenuse.

42. In right triangle, cos A =:

(A) opposite/hypotenuse
(B) adjacent/hypotenuse
(C) hypotenuse/adjacent
(D) adjacent/opposite

Correct Answer: B

Explanation: Cosine is adjacent over hypotenuse, so the correct choice is adjacent/hypotenuse.

43. For forces 20 N and 30 N at 105° between them, resultant magnitude uses:

(A) only addition of lengths
(B) law of sines only
(C) law of cosines
(D) Pythagoras with 90°

Correct Answer: C

Explanation: For forces 20 N and 30 N at 105° between them, resultant magnitude uses law of cosines.

44. In 3D cuboid problems, space diagonals often need:

(A) only addition of lengths
(B) circle theorems
(C) Heron's formula only
(D) Pythagoras in stages or cosine law

Correct Answer: D

Explanation: In 3D cuboid problems, space diagonals often need Pythagoras in stages or cosine law.

45. If EF = 20 cm from sin 30° = EF/40 in a right triangle, EF equals:

(A) 10 cm
(B) 20 cm
(C) 40 cm
(D) 30 cm

Correct Answer: A

Explanation: sin 30° = 1/2, so EF = 40 × 1/2 = 20 cm.

46. Law of cosines for side c is:

(A) $c^2 = a^2 + b^2 + 2ab \cos \gamma$
(B) $c^2 = a^2 + b^2 - 2ab \cos \gamma$
(C) $c = a + b - \gamma$
(D) $c^2 = ab \cos \gamma$

Correct Answer: B

Explanation: Standard form subtracts 2ab cos γ, so the correct choice is $c^2 = a^2 + b^2 - 2ab \cos \gamma$.

47. To find angle from three sides, use:

(A) $\sin \alpha = a/b$
(B) $a + b = c$
(C) $\cos \alpha = (b^2 + c^2 - a^2)/(2bc)$
(D) $\tan \alpha = a/c$ always

Correct Answer: C

Explanation: Cosine rule rearranged gives the angle when SSS is known.

48. The ambiguous case arises in:

(A) SSS
(B) ASA
(C) AAA always

(D) SSA

Correct Answer: D

Explanation: Side-Side-Angle can yield zero, one, or two triangles.

49. When sin β = 1 in SSA with acute α, there is:

(A) one right triangle if α acute
(B) no triangle if α acute
(C) two triangles always
(D) three triangles

Correct Answer: A

Explanation: β = 90° gives exactly one right triangle when α is acute.

50. Area Δ = (1/2) bc sin α uses angle:

(A) at vertex C only
(B) at vertex A between sides b and c
(C) 90° only
(D) none

Correct Answer: B

Explanation: Included angle between sides b and c is α at A... standard: sides b,c flank angle A which is α.

51. If two sides are 20 cm each and area is 200 cm², included angle θ satisfies:

(A) 200 = 20 + 20 + sin θ
(B) 200 = 400 cos θ
(C) 200 = (1/2)(20)(20) sin θ
(D) 200 = 20 sin θ

Correct Answer: C

Explanation: 200 = 200 sin θ gives sin θ = 1, so θ = 90°.

52. Perimeter of a semicircle of radius r is:

(A) πr
(B) 2πr
(C) r + π
(D) 2r + πr

Correct Answer: D

Explanation: Perimeter of a semicircle of radius r is 2r + πr.

53. Arc length l for central angle θ (degrees) and radius r is:

(A) (θ/360) × 2πr
(B) θr
(C) 2πr/θ
(D) θ/2πr

Correct Answer: A

Explanation: Arc is the fraction θ/360 of the full circumference 2πr.

54. Sector area with central angle θ (degrees) is:

(A) 2πr
(B) (θ/360) × πr²
(C) θ × r
(D) πr

Correct Answer: B

Explanation: Sector area is the fraction θ/360 of πr².

55. For θ = 60° and r = 14 cm, arc length ≈:

(A) 7 cm
(B) 28 cm
(C) 14.67 cm

(D) 44 cm

Correct Answer: C

Explanation: For θ = 60° and r = 14 cm, arc length ≈ 14.67 cm.

56. For θ = 60° and r = 14 cm, sector area ≈:

(A) 616 cm²
(B) 14 cm²
(C) 308 cm²
(D) 102.67 cm²

Correct Answer: D

Explanation: (60/360) × (22/7) × 196 ≈ 102.67 cm², so the correct choice is 102.67 cm².

57. In triangle ABC, α + β + γ equals:

(A) 180°
(B) 90°
(C) 360°
(D) 270°

Correct Answer: A

Explanation: Angle sum of any triangle is 180°, so the correct choice is 180°.

58. The height h in ambiguous SSA equals:

(A) b cos α
(B) b sin α
(C) a sin β
(D) c tan α

Correct Answer: B

Explanation: h = b sin α is the altitude to side a, so the correct choice is b sin α.

59. When α is obtuse in SSA and α + β ≥ 180°, there is:

(A) one triangle
(B) two triangles
(C) no triangle
(D) four triangles

Correct Answer: C

Explanation: Angles would exceed 180°, so no valid triangle.

60. cos(180° − θ) equals:

(A) cos θ
(B) sin θ
(C) −sin θ
(D) −cos θ

Correct Answer: D

Explanation: Cosine is negative for supplementary obtuse angles in QII.

61. sin(180° − θ) equals:

(A) sin θ
(B) −sin θ
(C) cos θ
(D) −cos θ

Correct Answer: A

Explanation: Sine stays equal for supplementary angles.

62. Reference angles for 138° and 111° are:

(A) 138° and 111°
(B) 42° and 69°
(C) 52° and 79°

(D) 222° and 249°

Correct Answer: B

Explanation: Reference angles for 138° and 111° are 42° and 69°.

63. If θ = 36° in QI, an angle α in QII with sin α = sin θ is:

(A) 36°
(B) 216°
(C) 144°
(D) 324°

Correct Answer: C

Explanation: sin(180° − 36°) = sin 36°, so α = 144°, so the correct choice is 144°.

64. If θ = 87° in QI, β in QII with cos β = −cos θ satisfies:

(A) 87°
(B) 180°
(C) 270°
(D) 93°

Correct Answer: D

Explanation: cos(180° − 87°) = −cos 87°, so β = 93°, so the correct choice is 93°.

65. tan(180° − θ) equals:

(A) −tan θ
(B) tan θ
(C) cot θ
(D) 1/tan θ

Correct Answer: A

Explanation: Tangent changes sign in quadrant II, so the correct choice is −tan θ.

66. In solving triangle with a = 12, b = 7, γ = 59°30′, first find:

(A) angle α immediately
(B) side c using law of cosines
(C) area only
(D) in-radius only

Correct Answer: B

Explanation: In solving triangle with a = 12, b = 7, γ = 59°30′, first find side c using law of cosines.

67. Radian measure 3π/4 equals:

(A) 45°
(B) 120°
(C) 135°
(D) 150°

Correct Answer: C

Explanation: 3π/4 × 180/π = 135°, so the correct choice is 135°.

68. Navigation uses trigonometry for:

(A) only spelling
(B) prime factorization
(C) vector null sums only
(D) bearings and distances

Correct Answer: D

Explanation: Navigation uses trigonometry for bearings and distances.

69. Sound wave modelling may use:

(A) trigonometric functions
(B) only circle chords
(C) Roman numerals

(D) matrix rank only

Correct Answer: A

Explanation: Sound wave modelling may use trigonometric functions.

70. Video game graphics use trigonometry for:

(A) only page layout
(B) rotations and projections
(C) ISBN codes
(D) prime lists

Correct Answer: B

Explanation: Video game graphics use trigonometry for rotations and projections.

71. If GE = 8.05 cm and GF = 9.6 cm in right triangle EGF at G, tan F equals:

(A) GF/GE
(B) GE/GE
(C) GE/GF
(D) 9.6/8.05

Correct Answer: C

Explanation: tan F = opposite/adjacent = GE/GF, so the correct choice is GE/GF.

72. Ex-radius r□ opposite side b equals:

(A) Δ/S
(B) S − b
(C) b/Δ
(D) Δ/(S − b)

Correct Answer: D

Explanation: Similarly r□ = Δ/(S − b), so the correct choice is Δ/(S − b).

73. Ex-radius r□ opposite side c equals:

(A) Δ/(S − c)
(B) Δ × c
(C) S/c
(D) c − S

Correct Answer: A

Explanation: Third excircle formula: r□ = Δ/(S − c), so the correct choice is Δ/(S − c).

74. If a triangle has sides 3, 4, 5, area by (1/2)ab sin C with C = 90° is:

(A) 12
(B) 6
(C) 7.5
(D) 60

Correct Answer: B

Explanation: (1/2)(3)(4) sin 90° = 6 square units, so the correct choice is 6.

75. For SSS 5, 12, 13, semi-perimeter S equals:

(A) 30
(B) 13
(C) 15
(D) 25

Correct Answer: C

Explanation: S = (5 + 12 + 13)/2 = 15, so the correct choice is 15.

76. Burj Khalifa height problems use:

(A) only counting stories
(B) vector dot products
(C) circle tangents only

(D) angle of elevation and distance

Correct Answer: D

Explanation: Tall structures are measured via elevation angles from a safe distance.

77. In right triangle with legs 6 and 8, hypotenuse is:

(A) 10
(B) 14
(C) 48
(D) 2

Correct Answer: A

Explanation: √(36 + 64) = 10, so the correct choice is 10.

78. cot θ equals:

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

Correct Answer: B

Explanation: Cotangent is the reciprocal of tangent, so the correct choice is 1/tan θ.

79. sec(180° − θ) equals:

(A) sec θ
(B) csc θ
(C) −sec θ
(D) 1

Correct Answer: C

Explanation: Secant changes sign in quadrant II, so the correct choice is −sec θ.

80. csc(180° − θ) equals:

(A) −csc θ
(B) sec θ
(C) tan θ
(D) csc θ

Correct Answer: D

Explanation: Cosecant stays equal for supplementary angles.

B. Less Important / Secondary Topics

81. Trigonometry helps measure tall structures without:

(A) climbing with a tape measure
(B) using angles
(C) knowing distance
(D) using ratios

Correct Answer: A

Explanation: Angle of elevation from ground distance avoids climbing.

82. Flight engineering uses trigonometry for:

(A) only paint colour
(B) forces and navigation angles
(C) page numbers
(D) prime tests

Correct Answer: B

Explanation: Flight engineering uses trigonometry for forces and navigation angles.

83. The unit circle helps extend trig beyond:

(A) 0° to 90° only

(B) only right triangles
(C) acute angles to obtuse and more
(D) only circles

Correct Answer: C

Explanation: The unit circle helps extend trig beyond acute angles to obtuse and more.

84. Sign of sine in quadrant II is:

(A) negative
(B) zero always
(C) undefined
(D) positive

Correct Answer: D

Explanation: y-values are positive above the x-axis in QII.

85. Sign of cosine in quadrant II is:

(A) negative
(B) positive
(C) always 1
(D) zero

Correct Answer: A

Explanation: x-values are negative left of the y-axis in QII.

86. Sign of tangent in quadrant II is:

(A) positive
(B) negative
(C) zero only
(D) 1 always

Correct Answer: B

Explanation: tan = sin/cos is positive/negative = negative in QII.

87. AAS means two angles and a non-included side are:

(A) never used
(B) always impossible
(C) given
(D) only for circles

Correct Answer: C

Explanation: AAS fixes a triangle up to congruence, so the correct choice is given.

88. ASA gives enough data because the third angle is:

(A) always 90°
(B) unknown forever
(C) zero
(D) 180° minus the other two

Correct Answer: D

Explanation: ASA gives enough data because the third angle is 180° minus the other two.

89. SSS solves a triangle using:

(A) law of cosines for angles
(B) only law of sines always
(C) no formula
(D) vector ratio

Correct Answer: A

Explanation: Cosine rule finds each angle from three sides.

90. The circumcircle of a triangle passes through:

(A) no vertices

(B) all three vertices
(C) only one vertex
(D) only the centroid

Correct Answer: B

Explanation: Circumcircle goes through A, B, and C, so the correct choice is all three vertices.

91. The incircle of a triangle touches:

(A) only vertices
(B) only extensions
(C) each side internally once
(D) no sides

Correct Answer: C

Explanation: Incenter is equidistant from all three sides.

92. Engineers combine triangles and circles in:

(A) only spelling books
(B) only tally marks
(C) only Roman numerals
(D) machine parts with inscribed/circumscribed circles

Correct Answer: D

Explanation: Engineers combine triangles and circles in machine parts with inscribed/circumscribed circles.

93. 3π/4 radians in degrees is:

(A) 135°
(B) 120°
(C) 150°
(D) 90°

Correct Answer: A

Explanation: Multiply by 180/π: 135°, so the correct choice is 135°.

94. π/2 radians equals:

(A) 180°
(B) 90°
(C) 45°
(D) 60°

Correct Answer: B

Explanation: Quarter turn is 90°, so the correct choice is 90°.

95. π radians equals:

(A) 90°
(B) 360°
(C) 180°
(D) 270°

Correct Answer: C

Explanation: Half circle is 180°, so the correct choice is 180°.

96. If sin θ = 0.6 and θ is acute, cos θ equals:

(A) 0.6
(B) 1
(C) 0.36
(D) 0.8

Correct Answer: D

Explanation: cos θ = √(1 − 0.36) = 0.8, so the correct choice is 0.8.

97. Depression angle is measured:

(A) below the horizontal

(B) above the horizontal
(C) from vertical up
(D) only at north

Correct Answer: A

Explanation: Depression angle is measured below the horizontal.

98. Bearings in navigation are measured:

(A) counterclockwise from south only
(B) clockwise from north
(C) from east only
(D) randomly

Correct Answer: B

Explanation: Bearings in navigation are measured clockwise from north.

99. Law of sines ratio equals:

(A) always 1
(B) semi-perimeter
(C) 2R where R is circumradius
(D) in-radius only

Correct Answer: C

Explanation: Law of sines ratio equals 2R where R is circumradius.

100. When all three angles are known but no side, the triangle is:

(A) fully fixed
(B) impossible
(C) a circle
(D) fixed in shape but not size

Correct Answer: D

Explanation: When all three angles are known but no side, the triangle is fixed in shape but not size.

101. Heron's formula avoids finding:

(A) any angles first
(B) area directly from S alone
(C) semi-perimeter
(D) side lengths

Correct Answer: A

Explanation: SSS area needs no angle measurement, so the correct choice is any angles first.

102. Segment perimeter equals:

(A) 2πr only
(B) arc length plus chord length
(C) πr only
(D) radius times angle

Correct Answer: B

Explanation: Boundary of a segment is arc plus chord.

103. Chord length from r and perpendicular distance d is:

(A) r − d
(B) 2r
(C) $2\sqrt{(r^2 - d^2)}$
(D) πd

Correct Answer: C

Explanation: Half-chord and d form a right triangle with radius r.

104. If two forces form a triangle, resultant uses:

(A) only subtraction

(B) circle theorems
(C) Heron only
(D) vector addition / cosine law

Correct Answer: D

Explanation: Forces as vectors add tip-to-tail; magnitude uses cosine law.

105. sin 90° equals:

(A) 1
(B) 0
(C) −1
(D) undefined only

Correct Answer: A

Explanation: Sine of a right angle is 1, so the correct choice is 1.

106. cos 90° equals:

(A) 1
(B) 0
(C) −1
(D) 1/2

Correct Answer: B

Explanation: Cosine of 90° is 0, so the correct choice is 0.

107. tan 90° is:

(A) 0
(B) 1
(C) undefined
(D) −1

Correct Answer: C

Explanation: tan 90° is undefined.

108. Inverse sin returns an angle from:

(A) a sum of sides
(B) area only
(C) semi-perimeter
(D) a ratio of opposite to hypotenuse

Correct Answer: D

Explanation: arcsin inverts the sine ratio, so the correct choice is a ratio of opposite to hypotenuse.