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MATHEMATICS TEST - CHAPTER 8: FUNDAMENTAL LAWS OF TRIGONOMETRY

Name:		Roll No.		Section:

Total Time: 3:20 Hour
Time Allowed: 200 Minutes

Total Marks: 200

PAPER OBJECTIVE
SECTION-A (MARKS 200)

NOTE: Section-A is compulsory. All parts of this section are to be answered on these pages and handed over to the center superintendent. Deleting / overwriting is not allowed. Do not use lead pencil.

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

Questions	A	B	C	D	A B C D
1. The distance between two points (x_1, y_1) and (x_2, y_2) in the plane is:	$\sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$	$(x_2 - x_1)^2 + (y_2 - y_1)^2$	$\sqrt{[(x_2 + x_1)^2 + (y_2 + y_1)^2]}$	$(x_2 - x_1) + (y_2 - y_1)$	●○○○
2. The distance between the points A(5, 4) and B(3, 2) is:	8	4	$\sqrt{8} + 2$	$2\sqrt{2}$	○○○●
3. The distance between the points (0, 0) and (3, 4) is:	7	5	1	25	○●○○
4. The distance between the points (1, 2) and (4, 6) is:	$\sqrt{7}$	25	5	7	○○●○
5. The fundamental law of trigonometry is:	$\cos(\alpha - \beta) = \cos\alpha \cos\beta + \sin\alpha \sin\beta$	$\cos(\alpha - \beta) = \cos\alpha \cos\beta - \sin\alpha \sin\beta$	$\cos(\alpha - \beta) = \cos\alpha - \cos\beta$	$\cos(\alpha - \beta) = \sin\alpha \sin\beta$	●○○○
6. In the proof of the fundamental law, the angles are drawn in standard position in a:	parabola	rectangle	unit circle	triangle only	○○●○
7. The coordinates of the point on the unit circle corresponding to angle α are:	$(\sin\alpha, \cos\alpha)$	$(\cos\alpha, \sin\alpha)$	$(\alpha, 1)$	$(1, \alpha)$	○●○○
8. In the proof, the distance between points C and D is equal to the distance between points:	A and B	O and C	O and D	A and C	●○○○
9. The fundamental law is proved by equating two expressions for the square of the distance:	$CD^2 = AB^2$	AB = OA	CD = OD	OC = OD	●○○○
10. Replacing β by −β in the fundamental law gives:	$\cos(\alpha + \beta) = \cos\alpha + \cos\beta$	$\cos(\alpha + \beta) = \sin\alpha \cos\beta$	$\cos(\alpha + \beta) = \cos\alpha \cos\beta + \sin\alpha \sin\beta$	$\cos(\alpha + \beta) = \cos\alpha \cos\beta - \sin\alpha \sin\beta$	○○○●
11. The identity cos(α + β) equals:	$\cos\alpha \cos\beta - \sin\alpha \sin\beta$	$\sin\alpha \cos\beta + \cos\alpha \sin\beta$	$\cos\alpha + \cos\beta$	$\cos\alpha \cos\beta + \sin\alpha \sin\beta$	●○○○
12. The value of cos(90° − 60°) using the fundamental law is:	1/2	0	1	$\sqrt{3}/2$	○○○●
13. The identity cos(90° − α) equals:	$-\sin\alpha$	$-\cos\alpha$	$\sin\alpha$	$\cos\alpha$	○○●○
14. The identity sin(90° − α) equals:	$-\sin\alpha$	$\cos\alpha$	$\sin\alpha$	$-\cos\alpha$	○●○○

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Questions	A	B	C	D	A B C D
15. The identity cos(−θ) equals:	−cos θ	cos θ	−sin θ	sin θ	○●○○
16. The identity sin(−θ) equals:	−cos θ	sin θ	−sin θ	cos θ	○○●○
17. Putting α = 0 in the fundamental law gives cos(−β) equals:	cos β	−cos β	sin β	1	●○○○
18. Without a calculator, sin 100° equals:	sin 10°	cos(−10°)	−cos 10°	cos 100°	○●○○
19. The identity sin(α + β) equals:	sin α + sin β	sin α cos β + cos α sin β	cos α cos β − sin α sin β	sin α cos β − cos α sin β	○●○○
20. The identity sin(α − β) equals:	cos α cos β + sin α sin β	sin α cos β − cos α sin β	sin α − sin β	sin α cos β + cos α sin β	○●○○
21. The identity tan(α + β) equals:	(tan α + tan β)/(1 − tan α tan β)	tan α tan β/(1 − tan α tan β)	(tan α − tan β)/(1 + tan α tan β)	(tan α + tan β)/(1 + tan α tan β)	●○○○
22. The identity tan(α − β) equals:	(tan α − tan β)/(1 + tan α tan β)	tan α − tan β	(tan α + tan β)/(1 − tan α tan β)	(tan α − tan β)/(1 − tan α tan β)	●○○○
23. To prove the identity of tan(α + β), we divide the numerator and denominator of sin(α + β)/cos(α + β) by:	sin α cos β	sin α sin β	cos α cos β	cos α sin β	○○●○
24. The identity tan(−α) equals:	−cot α	tan α	−tan α	cot α	○○●○
25. The identities of tangent ratios are true for all values of α and β for which:	tan α = 0	cos α ≠ 0 and cos β ≠ 0	sin α ≠ 0	cos α = 0	○●○○
26. The angles connected with a basic angle θ by a right angle or its multiple are called:	supplementary only	coterminal only	complementary only	allied angles	○○○●
27. Examples of allied angles of θ are:	θ + 1 and θ − 1	θ/2 and 2θ	90° ± θ, 180° ± θ, 270° ± θ, 360° ± θ	45° ± θ only	○○●○
28. A trigonometric ratio does not change when the allied angle contains an:	angle of 30°	angle of 45°	odd multiple of a right angle	even multiple of a right angle	○○○●
29. A trigonometric ratio changes to its co-ratio when the allied angle contains an:	even multiple of a right angle	angle of 45°	angle of 60°	odd multiple of a right angle	○○○●
30. For an odd multiple of a right angle, sine changes to:	secant	cosine	tangent	sine	○●○○
31. For an odd multiple of a right angle, tangent changes to:	tangent	sine	cosine	cotangent	○○○●

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Questions	A	B	C	D	A B C D
32. The sign of the ratio of an allied angle is decided by the:	quadrant of the terminal arm	length of the arm	colour of the figure	value of θ only	●○○○
33. The identity sin(90° + θ) equals:	−sin θ	sin θ	cos θ	−cos θ	○○●○
34. The identity cos(90° + θ) equals:	cos θ	−cos θ	sin θ	−sin θ	○○○●
35. The identity sin(180° − θ) equals:	−sin θ	−cos θ	cos θ	sin θ	○○○●
36. The identity cos(180° − θ) equals:	sin θ	cos θ	−sin θ	−cos θ	○○○●
37. The identity sin(180° + θ) equals:	−sin θ	sin θ	−cos θ	cos θ	●○○○
38. The identity cos(180° + θ) equals:	−cos θ	−sin θ	cos θ	sin θ	●○○○
39. The identity tan(180° + θ) equals:	−tan θ	−cot θ	tan θ	cot θ	○○●○
40. The identity tan(90° + θ) equals:	−tan θ	−cot θ	tan θ	cot θ	○●○○
41. The identity tan(90° − θ) equals:	tan θ	−tan θ	cot θ	−cot θ	○○●○
42. The identity sin(270° − θ) equals:	−sin θ	sin θ	−cos θ	cos θ	○○●○
43. The identity cos(270° + θ) equals:	−sin θ	cos θ	−cos θ	sin θ	○○○●
44. The identity sin(360° − θ) equals:	−cos θ	cos θ	−sin θ	sin θ	○○●○
45. The identity cos(360° − θ) equals:	−sin θ	sin θ	−cos θ	cos θ	○○○●
46. The exact value of cos 15° is:	(√6 + √2)/4	(√6 − √2)/4	(√3 + 1)/2	(√3 − 1)/2	●○○○
47. The exact value of sin 15° is:	(√6 + √2)/4	(√3 − 1)/2	(√6 − √2)/4	(√3 + 1)/4	○○●○
48. The exact value of sin 75° is:	(√6 + √2)/4	(√6 − √2)/4	(√3 + 1)/2	1/2	●○○○

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Questions	A	B	C	D	A B C D
49. The exact value of cos 75° is:	$(\sqrt{6}-\sqrt{2})/4$	$(\sqrt{3}-1)/2$	$(\sqrt{6}+\sqrt{2})/4$	$\sqrt{3}/2$	●○○○
50. The exact value of tan 15° is:	$\sqrt{3}+1$	$\sqrt{3}-1$	$2+\sqrt{3}$	$2-\sqrt{3}$	○○○●
51. The exact value of tan 75° is:	$\sqrt{3}+1$	$2+\sqrt{3}$	$\sqrt{3}-1$	$2-\sqrt{3}$	○●○○
52. The exact value of cos 165° is:	$(\sqrt{6}+\sqrt{2})/4$	$(\sqrt{6}-\sqrt{2})/4$	$-(\sqrt{6}-\sqrt{2})/4$	$-(\sqrt{6}+\sqrt{2})/4$	○○○●
53. The exact value of cos 345° is:	$(\sqrt{6}-\sqrt{2})/4$	$(\sqrt{6}+\sqrt{2})/4$	$-(\sqrt{6}-\sqrt{2})/4$	$-(\sqrt{6}+\sqrt{2})/4$	○●○○
54. The exact value of cos 120° is:	$-1/2$	$-\sqrt{3}/2$	$\sqrt{3}/2$	$1/2$	●○○○
55. The exact value of sin 120° is:	$1/2$	$\sqrt{3}/2$	$-\sqrt{3}/2$	$-1/2$	○●○○
56. The exact value of tan 120° is:	$-\sqrt{3}$	$1/\sqrt{3}$	$\sqrt{3}$	$-1/\sqrt{3}$	●○○○
57. The exact value of cos 105° is:	$(\sqrt{6}+\sqrt{2})/4$	$-(\sqrt{6}+\sqrt{2})/4$	$-(\sqrt{6}-\sqrt{2})/4$	$(\sqrt{6}-\sqrt{2})/4$	○○●○
58. The exact value of cos 285° is:	$(\sqrt{6}-\sqrt{2})/4$	$-(\sqrt{6}-\sqrt{2})/4$	$(\sqrt{6}+\sqrt{2})/4$	$-(\sqrt{6}+\sqrt{2})/4$	●○○○
59. The value of cos 15° is found by writing 15° as:	30° + 60°	45° − 30°	60° + 45°	90° − 30°	○●○○
60. The value of cos 75° is also found by writing it as cos(120° − 45°). It equals:	sin 120° cos 45° + cos 120° sin 45°	cos 120° cos 45° − sin 120° sin 45°	cos 120° cos 45° + sin 120° sin 45°	cos 45° − cos 120°	○○●○
61. If sin α = 3/5 and sin β = 5/13, with α and β acute, then sin(α + β) is:	63/65	16/65	56/65	33/65	○○●○
62. If sin α = 3/5 and sin β = 5/13, with α and β acute, then cos(α + β) is:	33/65	16/65	63/65	56/65	●○○○
63. If sin α = 3/5 and sin β = 5/13, with α and β acute, then tan(α + β) is:	63/16	16/63	56/33	33/56	○○●○
64. If sin A = 3/5 and sin B = 5/13 with A and B in quadrant II, then cos A and cos B are respectively:	4/5 and 12/13	−4/5 and 12/13	−4/5 and −12/13	−3/5 and −5/13	○○●○
65. For A and B in quadrant II with sin A = 3/5 and sin B = 5/13, the value of cos(A + B) is:	−63/65	63/65	33/65	−33/65	○○●○

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66. For A and B in quadrant II, the terminal arm of the angle A + B lies in the:	fourth quadrant	first quadrant	third quadrant	second quadrant	●○○○
67. If α, β and γ are the interior angles of a triangle, then tan α + tan β + tan γ equals:	1	0	tan α tan β tan γ	tan α + tan β tan γ	○○●○
68. If α + β + γ = 180°, then cot β cot γ + cot α cot γ + cot α cot β equals:	−1	1	cot α cot β cot γ	0	○●○○
69. If α + β + γ = 180°, then α + β equals:	180° + γ	γ	90° − γ	180° − γ	○○○●
70. If α + β + γ = 180°, then tan(α + β) equals:	−cot γ	tan γ	cot γ	−tan γ	○○○●
71. The expression a sin θ + b cos θ can be written in the form:	r sin(θ + φ)	r tan(θ + φ)	r cos θ only	r sin θ	●○○○
72. In a sin θ + b cos θ = r sin(θ + φ), the value of r is:	$\sqrt{(a^2 - b^2)}$	$\sqrt{(a^2 + b^2)}$	a + b	$a^2 + b^2$	○●○○
73. In a sin θ + b cos θ = r sin(θ + φ), the angle φ satisfies:	tan φ = a/b	tan φ = b/a	cos φ = a	sin φ = b	○●○○
74. In writing a sin θ + b cos θ, we let a = r cos φ and:	b = r tan φ	b = r cos φ	b = r sin φ	b = r	○○●○
75. The expression 12 sin θ + 5 cos θ can be written as:	17 sin(θ + φ)	7 sin(θ + φ)	13 sin(θ + φ), where tan φ = 12/5	13 sin(θ + φ), where tan φ = 5/12	○○○●
76. The expression sin θ + cos θ can be written as:	sin(θ + 45°)	√2 sin(θ + 30°)	√2 sin(θ + 45°)	2 sin(θ + 45°)	○○●○
77. The expression √3 sin θ + cos θ can be written as:	√3 sin(θ + 30°)	4 sin(θ + 30°)	2 sin(θ + 60°)	2 sin(θ + 30°)	○○○●
78. The maximum value of 3 sin θ + 4 cos θ is:	12	7	1	5	○○○●
79. A telephone pole is braced by a wire fastened to the ground 3 m from its base and to the pole 3 m above the ground. The angle the wire makes with the ground is:	45°	90°	30°	60°	●○○○
80. A pole is braced by a longer wire fastened 7 m above the ground and 3 m from the base. The sine of the angle the wire makes with the ground is:	3/√58	3/7	7/3	7/√58	○○○●
81. The double-angle identity for sine is:	$\sin 2\alpha = \sin^2 \alpha$	$\sin 2\alpha = 2 \sin \alpha \cos \alpha$	$\sin 2\alpha = 2 \sin \alpha$	$\sin 2\alpha = \cos^2 \alpha - \sin^2 \alpha$	○●○○
82. The double-angle identity for cosine is:	$\cos 2\alpha = \cos^2 \alpha - \sin^2 \alpha$	$\cos 2\alpha = \cos^2 \alpha + \sin^2 \alpha$	$\cos 2\alpha = 2 \cos \alpha$	$\cos 2\alpha = 2 \sin \alpha \cos \alpha$	●○○○

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83. Another form of cos 2α is:	$2\sin^2\alpha - 1$	$1 + 2\sin^2\alpha$	$1 - 2\cos^2\alpha$	$2\cos^2\alpha - 1$	○○○●
84. A second alternative form of cos 2α is:	$2\sin^2\alpha - 1$	$1 - 2\sin^2\alpha$	$2\cos^2\alpha + 1$	$1 + 2\sin^2\alpha$	○●○○
85. The double-angle identity for tangent is:	$\tan 2\alpha = 2\tan\alpha$	$\tan 2\alpha = \tan^2\alpha$	$\tan 2\alpha = 2\tan\alpha/(1 + \tan^2\alpha)$	$\tan 2\alpha = 2\tan\alpha/(1 - \tan^2\alpha)$	○○○●
86. The double-angle identities are derived by putting β = α in:	the product identities	the difference identities only	the half-angle identities	the sum identities	○○○●
87. The identity $2\cos^2\alpha$ is equal to:	$1 + \cos 2\alpha$	$2\cos 2\alpha$	$\cos 2\alpha$	$1 - \cos 2\alpha$	●○○○
88. The identity $2\sin^2\alpha$ is equal to:	$\sin 2\alpha$	$1 - \cos 2\alpha$	$1 + \cos 2\alpha$	$2\sin 2\alpha$	○●○○
89. Does cos 2θ = sin 2(90° − θ)?	Yes, only for 45°	Yes, always	Cannot be decided	No, since sin 2(90° − θ) = sin 2θ	○○○●
90. The exact value of sin 120° using the double-angle formula is:	$\sqrt{3}$	$\sqrt{3}/2$	$1/2$	1	○●○○
91. If sin θ = 3/5 and θ lies in quadrant I, then sin 2θ is:	24/25	6/5	7/25	12/25	●○○○
92. If sin θ = 3/5 and θ lies in quadrant I, then cos 2θ is:	24/25	16/25	7/25	−7/25	○○●○
93. If sin θ = 3/5 and θ lies in quadrant I, then tan 2θ is:	7/24	12/7	24/7	4/3	○○●○
94. For P(−3, 4) on the terminal side of θ, cos 2θ is:	−7/25	24/25	−24/25	7/25	●○○○
95. For P(−3, 4) on the terminal side of θ, sin 2θ is:	7/25	24/25	−7/25	−24/25	○○○●
96. For P(−3, 4) on the terminal side of θ, the angle 2θ lies in the:	second quadrant	first quadrant	fourth quadrant	third quadrant	○○○●
97. If sin α = y and α lies in quadrant II, then sin 2α is:	$2y$	$-2y\sqrt{(1 - y^2)}$	$2y\sqrt{(1 - y^2)}$	$1 - 2y^2$	○●○○
98. If sin θ = 1/2, then cos 2θ is:	−1/2	1/2	0	$\sqrt{3}/2$	○●○○
99. The half-angle identity for sine is:	$\sin(\alpha/2) = 2\sin\alpha$	$\sin(\alpha/2) = \pm\sqrt{[(1 - \cos\alpha)/2]}$	$\sin(\alpha/2) = (1 - \cos\alpha)/2$	$\sin(\alpha/2) = \pm\sqrt{[(1 + \cos\alpha)/2]}$	○●○○

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Questions	A	B	C	D	A B C D
100. The half-angle identity for cosine is:	$\cos(\alpha/2) = (1 + \cos\alpha)/2$	$\cos(\alpha/2) = \cos\alpha/2$	$\cos(\alpha/2) = \pm\sqrt{[(1 + \cos\alpha)/2]}$	$\cos(\alpha/2) = \pm\sqrt{[(1 - \cos\alpha)/2]}$	○○●○
101. The half-angle identity for tangent can be written as:	$\tan(\alpha/2) = (1 + \cos\alpha)/\sin\alpha$	$\tan(\alpha/2) = (1 - \cos\alpha)/\sin\alpha$	$\tan(\alpha/2) = \sin\alpha/(1 - \cos\alpha)$	$\tan(\alpha/2) = 2\tan\alpha$	○●○○
102. In the half-angle formulas, the sign (+ or −) is chosen according to the:	quadrant of 2α only	value of α only	degree of the angle	quadrant of α/2	○○○●
103. The exact value of cos 15° using the half-angle formula is:	$(\sqrt{6} + \sqrt{2})/4$	$\sqrt{3}/2$	$(\sqrt{6} - \sqrt{2})/4$	$(\sqrt{3} + 1)/4$	●○○○
104. The exact value of tan 22.5° is:	$2 - \sqrt{3}$	$\sqrt{2} + 1$	1/2	$\sqrt{2} - 1$	○○○●
105. The value of sin 22.5° cos 22.5° is:	1/2	$\sqrt{2}/4$	$\sqrt{2}/2$	1/4	○●○○
106. The expression $4\sin^4 x$ in terms of cosines to the power 1 is:	$(3 - 4\cos 2x + \cos 4x)/2$	$(1 - \cos 2x)/2$	$3 - 4\cos 2x + \cos 4x$	$(3 + 4\cos 2x + \cos 4x)/2$	●○○○
107. The triple-angle identity for sine is:	$\sin 3\alpha = 4\sin^3\alpha - 3\sin\alpha$	$\sin 3\alpha = 3\sin\alpha$	$\sin 3\alpha = 3\sin\alpha - 4\sin^3\alpha$	$\sin 3\alpha = 3\sin\alpha + 4\sin^3\alpha$	○○●○
108. The triple-angle identity for cosine is:	$\cos 3\alpha = 4\cos^3\alpha - 3\cos\alpha$	$\cos 3\alpha = 3\cos\alpha$	$\cos 3\alpha = 4\cos\alpha - 3\cos^3\alpha$	$\cos 3\alpha = 3\cos\alpha - 4\cos^3\alpha$	●○○○
109. The triple-angle identity for tangent is:	$\tan 3\alpha = (3\tan\alpha + \tan^3\alpha)/(1 + 3\tan^2\alpha)$	$\tan 3\alpha = 3\tan\alpha$	$\tan 3\alpha = (3\tan\alpha - \tan^3\alpha)/(1 - 3\tan^2\alpha)$	$\tan 3\alpha = (3\tan\alpha - \tan^3\alpha)/(1 + 3\tan^2\alpha)$	○○●○
110. In deriving sin 3α, we write 3α as:	2α + α	4α − α only	α/3	α − 2α	●○○○
111. The product-to-sum identity for $2\sin\alpha\cos\beta$ is:	$\sin(\alpha + \beta) + \sin(\alpha - \beta)$	$\cos(\alpha + \beta) + \cos(\alpha - \beta)$	$\cos(\alpha - \beta) - \cos(\alpha + \beta)$	$\sin(\alpha + \beta) - \sin(\alpha - \beta)$	●○○○
112. The product-to-sum identity for $2\cos\alpha\sin\beta$ is:	$\sin(\alpha + \beta) + \sin(\alpha - \beta)$	$\sin(\alpha + \beta) - \sin(\alpha - \beta)$	$\cos(\alpha + \beta) + \cos(\alpha - \beta)$	$\cos(\alpha + \beta) - \cos(\alpha - \beta)$	○●○○
113. The product-to-sum identity for $2\cos\alpha\cos\beta$ is:	$\cos(\alpha + \beta) - \cos(\alpha - \beta)$	$\sin(\alpha + \beta) + \sin(\alpha - \beta)$	$\cos(\alpha + \beta) + \cos(\alpha - \beta)$	$\cos\alpha + \cos\beta$	○○●○
114. The product-to-sum identity for $2\sin\alpha\sin\beta$ is:	$\cos(\alpha + \beta) + \cos(\alpha - \beta)$	$\cos(\alpha + \beta) - \cos(\alpha - \beta)$	$\sin(\alpha + \beta) - \sin(\alpha - \beta)$	$\cos(\alpha - \beta) - \cos(\alpha + \beta)$	○○○●
115. The identities for sums and differences are obtained by adding or subtracting the identities of:	half angles only	double angles only	$\tan(\alpha \pm \beta)$ only	$\sin(\alpha \pm \beta)$ and $\cos(\alpha \pm \beta)$	○○○●
116. Adding $\sin(\alpha + \beta)$ and $\sin(\alpha - \beta)$ gives:	$2\cos\alpha\cos\beta$	$2\sin\alpha\cos\beta$	$2\sin\alpha\sin\beta$	$2\cos\alpha\sin\beta$	○●○○

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117. Subtracting sin(α − β) from sin(α + β) gives:	2 cos α sin β	2 cos α cos β	2 sin α cos β	2 sin α sin β	●○○○
118. The product 2 cos 6θ sin 3θ as a sum or difference is:	cos 9θ − cos 3θ	sin 9θ − sin 3θ	sin 9θ + sin 3θ	cos 9θ + cos 3θ	○●○○
119. The expression sin 40° cos 20° + cos 40° sin 20° equals:	√3/2	1/2	1	√2/2	●○○○
120. The sum to product formula for sin A + sin B is:	2 cos[(A + B)/2] sin[(A − B)/2]	2 sin[(A + B)/2] cos[(A − B)/2]	2 cos[(A + B)/2] cos[(A − B)/2]	2 sin[(A + B)/2] sin[(A − B)/2]	○●○○
121. The sum to product formula for sin A − sin B is:	2 cos[(A + B)/2] sin[(A − B)/2]	2 sin[(A + B)/2] cos[(A − B)/2]	2 cos[(A + B)/2] cos[(A − B)/2]	−2 sin[(A + B)/2] sin[(A − B)/2]	●○○○
122. The sum to product formula for cos A + cos B is:	2 cos[(A + B)/2] sin[(A − B)/2]	−2 sin[(A + B)/2] sin[(A − B)/2]	2 cos[(A + B)/2] cos[(A − B)/2]	2 sin[(A + B)/2] cos[(A − B)/2]	○○●○
123. The sum to product formula for cos A − cos B is:	2 cos[(A + B)/2] cos[(A − B)/2]	2 sin[(A + B)/2] sin[(A − B)/2]	−2 sin[(A + B)/2] sin[(A − B)/2]	2 cos[(A + B)/2] sin[(A − B)/2]	○○●○
124. The expression cos 45° − cos 15° equals:	−sin 15°	−cos 15°	sin 15°	cos 30°	●○○○
125. The value of cos 195° − cos 105° is:	1/2	−√2/2	√2/2	−1/2	○●○○
126. The expression sin 75° + sin 15° equals:	√2/2	1/2	√6/2	√3/2	○○●○
127. The expression cos 75° + cos 15° equals:	√3/2	1/2	√2/2	√6/2	○○○●
128. The expression sin 75° − sin 15° equals:	√6/2	√3/2	√2/2	1/2	○○●○
129. The expression cos 15° − cos 75° equals:	1/2	√3/2	√6/2	√2/2	○○○●
130. The sum cos 6α + cos 5α + cos 3α + cos 2α is expressed as the product:	2 cos(4α) cos(1.5α)	4 sin(4α) cos(1.5α) cos(0.5α)	4 cos(4α) cos(1.5α) cos(0.5α)	4 cos(4.5α) cos(1.5α) cos(0.5α)	○○●○
131. Using the product-to-sum formula, cos 195° − cos 105° can be found from:	−2 cos 150° cos 45°	2 cos 150° cos 45°	2 sin 150° sin 45°	−2 sin 150° sin 45°	○○○●
132. The identity (1 − tan α tan β)/(1 + tan α tan β) equals:	tan(α + β)	cos(α − β)/cos(α + β)	cos(α + β)/cos(α − β)	sin(α + β)/sin(α − β)	○○●○
133. The identity cos 3θ + 3 cos θ equals:	$4\sin^3\theta$	$4\cos^3\theta$	3 cos θ	$\cos^3\theta$	○●○○

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Questions	A	B	C	D	A B C D
134. The identity $3\sin\theta - \sin 3\theta$ equals:	$4\sin^3\theta$	$\sin^3\theta$	$3\sin\theta$	$4\cos^3\theta$	●○○○
135. The identity $\sin 16x$ equals:	$2\sin 8x$	$16\sin x$	$8\sin x\cos x\cos 2x\cos 4x$	$16\sin x\cos x\cos 2x\cos 4x\cos 8x$	○○○●
136. If $\tan\theta = 1$, the value of $\sin 2\theta$ is:	1	0	2	1/2	●○○○
137. If $\sin A = 1/2$ for acute A, the value of $\cos 2A$ is:	1/2	0	$-1/2$	$\sqrt{3}/2$	●○○○
138. If $\cos\theta = 3/5$, the value of $\cos 2\theta$ is:	$-7/25$	$-24/25$	24/25	7/25	●○○○
139. If $\cos\theta = 3/5$ and θ is acute, the value of $\sin 2\theta$ is:	12/25	6/5	24/25	7/25	○○●○
140. If $\tan\theta = 3/4$ and θ is acute, the value of $\tan 2\theta$ is:	7/24	24/7	6/7	3/2	○●○○
141. The value of $\sin 15^\circ\cos 15^\circ$ is:	1/4	$\sqrt{3}/4$	1/2	$\sqrt{3}/2$	●○○○
142. The value of $\cos^2 15^\circ - \sin^2 15^\circ$ is:	1/2	0	1	$\sqrt{3}/2$	○○○●
143. The value of $2\sin 75^\circ\cos 75^\circ$ is:	1/2	$\sqrt{3}/2$	0	1	●○○○
144. The value of $\sin 45^\circ\cos 15^\circ + \cos 45^\circ\sin 15^\circ$ is:	1	$\sqrt{3}/2$	$\sqrt{2}/2$	1/2	○●○○
145. The value of $\cos 70^\circ\cos 20^\circ - \sin 70^\circ\sin 20^\circ$ is:	-1	1/2	0	1	○○●○
146. The value of $\cos 40^\circ\cos 50^\circ - \sin 40^\circ\sin 50^\circ$ is:	1	-1	0	1/2	○○●○
147. The value of $\sin 80^\circ\cos 20^\circ - \cos 80^\circ\sin 20^\circ$ is:	1	$\sqrt{2}/2$	1/2	$\sqrt{3}/2$	○○○●
148. The value of $(\tan 75^\circ + \tan 15^\circ)/(1 - \tan 75^\circ\tan 15^\circ)$ (using $\tan(\alpha+\beta)$) is:	undefined since $\tan 90^\circ$ is undefined	0	1	$\sqrt{3}$	●○○○
149. The fundamental law helps to find the exact values of the trigonometric ratios of angles such as:	10° and 20°	15° and 75°	7° and 9°	1° and 2°	○●○○
150. Fundamental trigonometric identities are used in simplifying complex problems in fields such as:	cooking only	music only	calculus, physical and social sciences	painting only	○○●○

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Questions	A	B	C	D	A B C D
151. The distance between the points (−2, 3) and (1, 7) is:	√7	5	25	7	○●○○
152. The distance between the points (2, −1) and (−4, 7) is:	√14	10	14	100	○●○○
153. The distance between the points (a, 0) and (0, b) is:	$\sqrt{(a^2 + b^2)}$	a + b	$\sqrt{(a^2 - b^2)}$	$a^2 + b^2$	●○○○
154. The value of sin 150° is:	−√3/2	−1/2	√3/2	1/2	○○○●
155. The value of cos 150° is:	−1/2	√3/2	1/2	−√3/2	○○○●
156. The value of tan 135° is:	−√3	√3	−1	1	○○●○
157. The value of sin 210° is:	−√3/2	1/2	−1/2	√3/2	○○●○
158. The value of cos 240° is:	√3/2	−√3/2	1/2	−1/2	○○○●
159. The value of sin 300° is:	√3/2	1/2	−1/2	−√3/2	○○○●
160. The value of cos 300° is:	−√3/2	1/2	√3/2	−1/2	○●○○
161. The value of tan 225° is:	0	1	−1	√3	○●○○
162. The value of sin 135° is:	√2/2	−√2/2	1/2	−1/2	●○○○
163. The value of cos 135° is:	−1/2	√2/2	1/2	−√2/2	○○○●
164. The exact value of sin 105° is:	−(√6 + √2)/4	(√6 − √2)/4	(√6 + √2)/4	1/2	○○●○
165. The exact value of sin 165° is:	1/2	−(√6 − √2)/4	(√6 − √2)/4	(√6 + √2)/4	○○●○
166. The exact value of tan 105° is:	−(2 − √3)	2 + √3	−(2 + √3)	2 − √3	○○●○
167. The exact value of tan 165° is:	√3 − 2	2 − √3	2 + √3	−(2 + √3)	●○○○

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Questions	A	B	C	D	A B C D
168. The exact value of sin 195° is:	$-(\sqrt{6}-\sqrt{2})/4$	$(\sqrt{6}+\sqrt{2})/4$	$(\sqrt{6}-\sqrt{2})/4$	$-(\sqrt{6}+\sqrt{2})/4$	●○○○
169. The exact value of cos 255° is:	$-(\sqrt{6}+\sqrt{2})/4$	$(\sqrt{6}-\sqrt{2})/4$	$-(\sqrt{6}-\sqrt{2})/4$	$(\sqrt{6}+\sqrt{2})/4$	○○●○
170. The sum cos(α + β) + cos(α − β) equals:	2 sin α cos β	2 cos α cos β	−2 sin α sin β	2 sin α sin β	○●○○
171. The difference cos(α − β) − cos(α + β) equals:	−2 sin α sin β	2 sin α cos β	2 cos α cos β	2 sin α sin β	○○○●
172. The difference sin(α + β) − sin(α − β) equals:	2 cos α sin β	2 sin α cos β	2 cos α cos β	2 sin α sin β	●○○○
173. The identity tan(45° + θ) equals:	(1 + tan θ)/(1 − tan θ)	(1 − tan θ)/(1 + tan θ)	tan θ − 1	1 + tan θ	●○○○
174. The identity tan(45° − θ) equals:	1/tan θ	(1 − tan θ)/(1 + tan θ)	(1 + tan θ)/(1 − tan θ)	1 − tan θ	○●○○
175. The identity tan(180° − α) equals:	tan α	−tan α	−cot α	cot α	○●○○
176. The value of 2 sin 30° cos 30° is:	1/2	√3/2	1	√3	○●○○
177. The value of $2\cos^2 30° - 1$ is:	1	0	√3/2	1/2	○○○●
178. The value of $2\cos^2 45° - 1$ is:	1/2	0	1	−1	○●○○
179. If sin θ = 5/13 and cos θ = 12/13, then sin 2θ is:	10/13	119/169	60/169	120/169	○○○●
180. If sin θ = 5/13 and cos θ = 12/13, then cos 2θ is:	119/169	−119/169	120/169	7/13	●○○○
181. If tan θ = 1/2, then sin 2θ is:	1/2	3/5	4/5	2/5	○○●○
182. If tan θ = 1/2, then cos 2θ is:	4/5	−3/5	1/2	3/5	○○○●
183. The value of $\sin^2 15°$ is:	(2 + √3)/4	(2 − √3)/4	1/4	(√3 − 1)/4	○●○○
184. The value of $\cos^2 15°$ is:	(2 + √3)/4	(√3 + 1)/4	3/4	(2 − √3)/4	●○○○

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Questions	A	B	C	D	A B C D
185. If sin θ = 1/2, then sin 3θ is:	−1	0	1/2	1	○○○●
186. If cos θ = 1/2, then cos 3θ is:	0	−1	1/2	1	○●○○
187. The expression (1 − cos 2θ)/sin 2θ equals:	sin θ	cot θ	tan θ	cos θ	○○●○
188. The expression (1 + cos 2θ)/sin 2θ equals:	cos θ	tan θ	cot θ	sin θ	○○●○
189. The expression sin 2θ/(1 + cos 2θ) equals:	cot θ	1	sin θ	tan θ	○○○●
190. The expression $\cos^4 \theta - \sin^4 \theta$ equals:	1	sin 2θ	cos 2θ	cos θ	○○●○
191. The identity cos 4θ equals:	$\cos^2 \theta - \sin^2 \theta$	2 sin 2θ cos 2θ	$2 \sin^2 2\theta - 1$	$1 - 2 \sin^2 2\theta$	○○○●
192. The value of 2 sin 75° cos 15° is:	1 − √3/2	1 + √3/2	1	√3/2	○●○○
193. The value of 2 cos 75° sin 15° is:	√3/2	1 + √3/2	1 − √3/2	1/2	○○●○
194. The value of 2 sin 105° sin 15° is:	−1/2	0	1	1/2	○○○●
195. The value of 2 cos 75° cos 15° is:	1/2	√3/2	−1/2	1	●○○○
196. The expression cos(α + β) cos(α − β) equals:	$\cos^2 \alpha + \sin^2 \beta$	$\cos^2 \beta - \sin^2 \alpha$	$\sin^2 \alpha - \cos^2 \beta$	$\cos^2 \alpha - \sin^2 \beta$	○○○●
197. The expression tan A + tan B equals:	sin(A − B)/(cos A cos B)	sin(A + B)/(cos A cos B)	cos(A + B)/(cos A cos B)	sin(A + B)/(sin A sin B)	○●○○
198. The identity cot(A + B) equals:	(cot A + cot B)/(cot A cot B − 1)	(cot A cot B − 1)/(cot B − cot A)	(cot A cot B − 1)/(cot A + cot B)	(cot A cot B + 1)/(cot A + cot B)	○○●○
199. The identity sin 2α in terms of tan α is:	tan α/(1 + $\tan^2 \alpha$)	2 tan α/(1 + $\tan^2 \alpha$)	$(1 - \tan^2 \alpha)/(1 + \tan^2 \alpha)$	2 tan α/(1 − $\tan^2 \alpha$)	○●○○
200. The identity cos 2α in terms of tan α is:	$1 - \tan^2 \alpha$	$(1 - \tan^2 \alpha)/(1 + \tan^2 \alpha)$	2 tan α/(1 + $\tan^2 \alpha$)	$(1 + \tan^2 \alpha)/(1 - \tan^2 \alpha)$	○●○○

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