

TRIGONOMETRIC IDENTITIES

1. Distance r of the point $P(x_1, y_1)$ from the origin is given by the relation $r =$ _____

- a) $x_1^2 + y_1^2$
- b) $\sqrt{x_1^2 + y_1^2}$
- c) $\sqrt{x_1^2 + y_1^2 + 2x_1y_1}$
- d) $\sqrt{x_1^2}$
- e) none of these

Answer: b

2. If $\sin \theta_1 = \sin \theta_2$ and $\cos \theta_1 = \cos \theta_2$ then

- a) $\sin \frac{1}{2}(\theta_1 + \theta_2) = 0$
- b) $\sin \frac{1}{2}(\theta_1 - \theta_2) = 0$
- c) $\cos \frac{1}{2}(\theta_1 + \theta_2) = 0$
- d) $\cos \frac{1}{2}(\theta_2 - \theta_1) = -1$
- e) none of these

Answer: b

3. Distance r of the point $P(1, 2)$ from the origin $O(0, 0)$ is given by the relation $r =$ _____ ?

- a) 5
- b) $\sqrt{5}$
- c) 25
- d) $\sqrt{3}$
- e) None of these

Answer: b

4. $\cos(\alpha - \beta) =$

- a) $\cos \alpha \cos \beta - \sin \alpha \sin \beta$
- b) $\cos \alpha \cos \beta + \sin \alpha \sin \beta$
- c) $\sin \alpha \cos \beta - \cos \alpha \sin \beta$
- d) $\sin \alpha \cos \beta + \cos \alpha \sin \beta$
- e) $\sin \alpha \sin \beta - \cos \alpha \cos \beta$

Answer: b

5. $\cos(\alpha + \beta) =$

- a) $\cos \alpha \cos \beta - \sin \alpha \sin \beta$
- b) $\cos \alpha \cos \beta + \sin \alpha \sin \beta$
- c) $\sin \alpha \cos \beta - \cos \alpha \sin \beta$
- d) $\sin \alpha \cos \beta + \cos \alpha \sin \beta$
- e) $\sin \alpha \sin \beta - \cos \alpha \cos \beta$

Answer: a

6. $\sin(\alpha - \beta) =$

- a) $\cos \alpha \cos \beta - \sin \alpha \sin \beta$
- b) $\cos \alpha \cos \beta + \sin \alpha \sin \beta$
- c) $\sin \alpha \cos \beta - \cos \alpha \sin \beta$
- d) $\sin \alpha \cos \beta + \cos \alpha \sin \beta$
- e) $\sin \alpha \sin \beta - \cos \alpha \cos \beta$

Answer: c

7. $\sin(\alpha + \beta) =$

- a) $\cos \alpha \cos \beta - \sin \alpha \sin \beta$
- b) $\cos \alpha \cos \beta + \sin \alpha \sin \beta$
- c) $\sin \alpha \cos \beta - \cos \alpha \sin \beta$
- d) $\sin \alpha \cos \beta + \cos \alpha \sin \beta$
- e) $\sin \alpha \sin \beta - \cos \alpha \cos \beta$

Answer: d

8. $\cos(-\alpha) =$

- a) $\sec \alpha$
- b) $-\sin \alpha$
- c) $\sin \alpha$
- d) $-\cos \alpha$
- e) $\cos \alpha$

Answer: e

9. $\sin(-\alpha) =$

- a) $\sec \alpha$
- b) $-\sin \alpha$
- c) $\sin \alpha$
- d) $-\cos \alpha$
- e) $\cos \alpha$

Answer: b

10. $\cot(-\alpha) =$
a) $-\tan \alpha$
b) $\tan \alpha$
c) $\cot \alpha$
d) $-\cot \alpha$
e) $\cos \alpha$
Answer: d

11. $\tan(-\alpha) =$
a) $-\tan \alpha$
b) $\tan \alpha$
c) $\cot \alpha$
d) $-\cot \alpha$
e) $\cos \alpha$
Answer: a

12. $\sec(-\alpha) =$
a) $-\cos \alpha$
b) $-\sec \alpha$
c) $\sec \alpha$
d) $\operatorname{cosec} \alpha$
e) $-\operatorname{cosec} \alpha$
Answer: c

13. $\cos(90^\circ - \alpha) =$
a) $-\cos \alpha$
b) $\cos \alpha$
c) $-\sin \alpha$
d) $\sin \alpha$
e) $-\operatorname{cosec} \alpha$
Answer: d

14. $\sin(90^\circ - \alpha) =$
a) $\tan \alpha$
b) $\cos \alpha$
c) $-\sin \alpha$
d) $\sin \alpha$
e) $-\operatorname{cosec} \alpha$
Answer: b

15. $\tan(90^\circ - \alpha) =$
a) $\tan \alpha$
b) $-\tan \alpha$
c) $-\sin \alpha$
d) $-\cot \alpha$
e) $\cot \alpha$
Answer: e

16. $\cot(90^\circ - \alpha) =$
a) $\tan \alpha$
b) $-\tan \alpha$
c) $-\sin \alpha$
d) $-\cot \alpha$
e) $\cot \alpha$
Answer: a

17. $\sec(90^\circ - \alpha) =$
a) $-\operatorname{cosec} \alpha$
b) $\operatorname{cosec} \alpha$
c) $-\sec \alpha$
d) $\sec \alpha$
e) $\cot \alpha$
Answer: b

18. $\cos(\alpha - 90^\circ) =$
a) $-\operatorname{cosec} \alpha$
b) $\operatorname{cosec} \alpha$
c) $-\sec \alpha$
d) $\sin \alpha$
e) $\cot \alpha$
Answer: d

19. $\operatorname{cosec}(90^\circ - \alpha) =$
a) $-\operatorname{cosec} \alpha$
b) $\operatorname{cosec} \alpha$
c) $-\sec \alpha$
d) $\sec \alpha$
e) $\cot \alpha$
Answer: d

20. $\sec(\alpha - 90^\circ) =$
a) $\operatorname{cosec} \alpha$
b) $-\sec \alpha$

c) $-\cot \alpha$

d) $\cot \alpha$

e) $\cos \alpha$

Answer: a

21. $\sin(\alpha - 90^\circ) =$

a) $-\cos \alpha$

b) $\operatorname{cosec} \alpha$

c) $-\sec \alpha$

d) $\sin \alpha$

e) $\cos \alpha$

Answer: a

22. $\tan(\alpha - 90^\circ) =$

a) $\tan \alpha$

b) $-\tan \alpha$

c) $-\cot \alpha$

d) $\cot \alpha$

e) $\cos \alpha$

Answer: c

23. $\operatorname{cosec}(\alpha - 90^\circ) =$

a) $\operatorname{cosec} \alpha$

b) $-\sec \alpha$

c) $-\cot \alpha$

d) $\cot \alpha$

e) $\cos \alpha$

Answer: b

24. $\cos\left(\frac{\pi}{2} - \alpha\right) =$

a) $\operatorname{cosec} \alpha$

b) $\cos \alpha$

c) $-\cos \alpha$

d) $-\sin \alpha$

e) $\sin \alpha$

Answer: e

25. $\sin\left(\frac{\pi}{2} - \alpha\right) =$

a) $\operatorname{cosec} \alpha$

b) $\cos \alpha$

c) $-\cos \alpha$

d) $-\sin \alpha$

e) $\sin \alpha$

Answer: b

26. $\cot\left(\frac{\pi}{2} - \alpha\right) =$

a) $\cot \alpha$

b) $\tan \alpha$

c) $-\cos \alpha$

d) $-\sin \alpha$

e) $\sin \alpha$

Answer: b

27. $\tan\left(\frac{\pi}{2} - \alpha\right) =$

a) $\cot \alpha$

b) $\tan \alpha$

c) $-\cos \alpha$

d) $-\sin \alpha$

e) $\sin \alpha$

Answer: a

28. $\cos\left(\alpha - \frac{\pi}{2}\right) =$

a) $\sec \alpha$

b) $-\cos \alpha$

c) $\cos \alpha$

d) $-\sin \alpha$

e) $\sin \alpha$

Answer: e

29. $\sin\left(\alpha - \frac{\pi}{2}\right) =$

a) $\sec \alpha$

b) $-\cos \alpha$

c) $\cos \alpha$

d) $-\sin \alpha$

e) $\sin \alpha$

Answer: b

30. $\tan\left(\alpha - \frac{\pi}{2}\right) =$

a) $\sec \alpha$

b) $\cot \alpha$

c) $-\cot \alpha$

d) $\tan \alpha$

e) $-\tan \alpha$

Answer: c

31. $\sec\left(\alpha - \frac{\pi}{2}\right) =$

- a) $\sec \alpha$
- b) $\cot \alpha$
- c) $\operatorname{cosec} \alpha$
- d) $\tan \alpha$
- e) $-\tan \alpha$

Answer: c

32. $\operatorname{cosec}\left(\alpha - \frac{\pi}{2}\right) =$

- a) $\sec \alpha$
- b) $-\sec \alpha$
- c) $\operatorname{cosec} \alpha$
- d) $\tan \alpha$
- e) $-\tan \alpha$

Answer: b

33. $\cos(\alpha + 90^\circ) =$

- a) $-\sin \alpha$
- b) $\sin \alpha$
- c) $\cos \alpha$
- d) $-\cos \alpha$
- e) $-\tan \alpha$

Answer: a

34. $\sin(\alpha + 90^\circ) =$

- a) $-\sin \alpha$
- b) $\sin \alpha$
- c) $\cos \alpha$
- d) $-\cos \alpha$
- e) $-\tan \alpha$

Answer: c

35. $\cot(\alpha + 90^\circ) =$

- a) $-\sin \alpha$
- b) $-\cot \alpha$
- c) $\cot \alpha$
- d) $\tan \alpha$
- e) $-\tan \alpha$

Answer: e

36. $\csc(\alpha + 90^\circ) =$

- a) $-\sin \alpha$
- b) $-\csc \alpha$
- c) $-\sec \alpha$
- d) $\csc \alpha$
- e) $\sec \alpha$

Answer: e

37. $\cos\left(\frac{\pi}{2} + \alpha\right) =$

- a) $-\sin \alpha$
- b) $-\csc \alpha$
- c) $-\sec \alpha$
- d) $\csc \alpha$
- e) $\sec \alpha$

Answer: a

38. $\sin\left(\frac{\pi}{2} + \alpha\right) =$

- a) $\sin \alpha$
- b) $-\csc \alpha$
- c) $-\sec \alpha$
- d) $\cos \alpha$
- e) $\sec \alpha$

Answer: a

39. $\tan(\alpha + 90^\circ) =$

- a) $-\sin \alpha$
- b) $-\cot \alpha$
- c) $\cot \alpha$
- d) $\tan \alpha$
- e) $-\tan \alpha$

Answer: b

40. $\sec(\alpha + 90^\circ) =$

- a) $-\sin \alpha$
- b) $\sec \alpha$
- c) $-\sec \alpha$
- d) $\csc \alpha$
- e) $-\csc \alpha$

Answer: e

41. $\sec\left(\alpha + \frac{\pi}{2}\right) =$

- a) $\sec \alpha$
- b) $-\csc \alpha$

- c) $\cot \alpha$
- d) $-\cot \alpha$
- e) $-\sec \alpha$

Answer: b

42. $\sin(\pi + \alpha) =$

- a) $\cos \alpha$
- b) $-\cos \alpha$
- c) $-\sin \alpha$
- d) $\sin \alpha$
- e) $\cot \alpha$

Answer: c

43. $\csc(\pi - \alpha) =$

- a) $\sec \alpha$
- b) $-\sec \alpha$
- c) $-\csc \alpha$
- d) $\csc \alpha$
- e) $-\tan \alpha$

Answer: d

44. $\cot(\pi - \alpha) =$

- a) $\sin \alpha$
- b) $\cot \alpha$
- c) $-\cot \alpha$
- d) $\tan \alpha$
- e) $-\tan \alpha$

Answer: c

45. $\csc\left(\alpha + \frac{\pi}{2}\right) =$

- a) $\sec \alpha$
- b) $-\csc \alpha$
- c) $\cot \alpha$
- d) $-\cot \alpha$
- e) $-\sec \alpha$

Answer: a

46. $\sin(\pi - \alpha) =$

- a) $-\cos \alpha$
- b) $\cos \alpha$
- c) $-\sin \alpha$
- d) $\sin \alpha$
- e) $-\sec \alpha$

Answer: d

47. $\sec(\pi - \alpha) =$

- a) $\sec \alpha$
- b) $-\sec \alpha$
- c) $-\csc \alpha$
- d) $\csc \alpha$
- e) $-\tan \alpha$

Answer: b

48. $\cos(\pi + \alpha) =$

- a) $\cos \alpha$
- b) $-\cos \alpha$
- c) $-\sin \alpha$
- d) $\sin \alpha$
- e) $\cot \alpha$

Answer: b

49. $\tan(\pi - \alpha) =$

- a) $\sin \alpha$
- b) $\cot \alpha$
- c) $-\cot \alpha$
- d) $\tan \alpha$
- e) $-\tan \alpha$

Answer: e

50. $\cos(\pi - \alpha) =$

- a) $-\cos \alpha$
- b) $\cos \alpha$
- c) $-\sin \alpha$
- d) $\sin \alpha$
- e) $-\sec \alpha$

Answer: a

51. $\csc\left(\alpha + \frac{\pi}{2}\right) =$

- a) $\sec \alpha$
- b) $-\csc \alpha$
- c) $\cot \alpha$
- d) $-\cot \alpha$
- e) $-\sec \alpha$

Answer: a

52. If $y = \frac{2 \sin \alpha}{1 + \cos \alpha + \sin \alpha}$ then

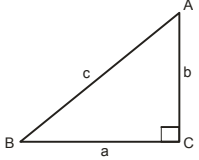
$\frac{1 - \cos \alpha + \sin \alpha}{1 + \sin \alpha}$ is equal to

- a) $1/y$
- b) Y

- c) $1 - y$
- d) $1 + y$
- e) None of these

Answer: c

53. In the triangle ABC, where C is the right angle, $\tan A + \tan B =$



- a) $a + b$
- b) $\frac{a^2 + b^2}{ab}$
- c) a^2 / bc
- d) b^2 / ac
- e) None of these

Answer: b

54. $\sin(2\pi - \theta) =$ _____

- a) $\sin \theta$
- b) $-\sin \theta$
- c) $\cos \theta$
- d) $-\cos \theta$
- e) $\tan \theta$

Answer: b

55. The value of the expression

$$\frac{1 - \sin^2 y}{1 + \cos y} + \frac{1 - \cos y}{\sin y} - \frac{\sin y}{1 - \cos y}$$
 is

- a) 0
- b) 1
- c) $\sin y$
- d) $\cos y$
- e) None of these

Answer: d

56. $\cos(2\pi - \theta) =$ _____ ?

- a) $\sin \theta$
- b) $-\sin \theta$
- c) $\cos \theta$
- d) $-\cos \theta$
- e) $\tan \theta$

Answer: c

57. $\cot(\alpha - \beta) =$

- a) $\frac{\cot \alpha - \cot \beta}{1 + \cot \alpha \cot \beta}$
- b) $\frac{\cot \alpha + \cot \beta}{1 - \cot \alpha \cot \beta}$
- c) $\frac{\cot \alpha \cot \beta - 1}{\cot \alpha + \cot \beta}$
- d) $\frac{\cot \alpha \cot \beta + 1}{-\cot \alpha + \cot \beta}$
- e) none of these

Answer: d

58. $\tan(\alpha - \beta) =$

- a) $\frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$
- b) $\frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$
- c) $\frac{\cot \alpha + \cot \beta}{1 - \cot \alpha \cot \beta}$
- d) $\frac{\cot \alpha - \cot \beta}{1 + \cot \alpha \cot \beta}$
- e) none of these

Answer: a

59. $\tan(\pi + \alpha) =$

- a) $\tan \alpha$
- b) $-\tan \alpha$
- c) $\cot \alpha$
- d) $-\cot \alpha$
- e) $\sec \alpha$

Answer: a

60. $\sec(\pi + \alpha) =$

- a) $\tan \alpha$
- b) $-\csc \alpha$
- c) $\csc \alpha$
- d) $-\sec \alpha$
- e) $\sec \alpha$

Answer: d

61. $\csc(\pi + \alpha) =$

- a) $\tan \alpha$
- b) $-\csc \alpha$
- c) $\csc \alpha$
- d) $-\sec \alpha$
- e) $\sec \alpha$

Answer: b

62. $\tan(\alpha + \beta) =$
- a) $\frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$
 - b) $\frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$
 - c) $\frac{\cot \alpha + \cot \beta}{1 - \cot \alpha \cot \beta}$
 - d) $\frac{\cot \alpha - \cot \beta}{1 + \cot \alpha \cot \beta}$
 - e) none of these

Answer: b

63. $\cot(\alpha + \beta) =$
- a) $\frac{\cot \alpha - \cot \beta}{1 + \cot \alpha \cot \beta}$
 - b) $\frac{\cot \alpha + \cot \beta}{1 - \cot \alpha \cot \beta}$
 - c) $\frac{\cot \alpha \cot \beta - 1}{\cot \alpha + \cot \beta}$
 - d) $\frac{\cot \alpha \cot \beta + 1}{\cot \alpha + \cot \beta}$
 - e) none of these

Answer: c

64. $2 \cos^2\left(\frac{\alpha}{2}\right) =$
- a) $1 + \cos \alpha$
 - b) $1 - \cos \alpha$
 - c) $1 + \sin \alpha$
 - d) $1 - \sin \alpha$
 - e) $1 - 2 \sin^2 \alpha$

Answer: a

65. $\sin \alpha =$
- a) $1 - 2 \sin^2 \frac{\alpha}{2}$

b) $2 \cos^2 \frac{\alpha}{2} + 1$

c) $\sin \frac{\alpha}{2} \cos \frac{\alpha}{2}$

d) $2 \sin \frac{\alpha}{2} \cos \frac{\alpha}{2}$

e) $1 - 2 \sin^2 \alpha$

Answer: a

66. $\cos \alpha =$

a) $\cos^2 \frac{\alpha}{2} + \sin^2 \frac{\alpha}{2}$

b) $\cos^2 \frac{\alpha}{2} - \sin^2 \frac{\alpha}{2}$

c) $\cos^2 \alpha - \sin^2 \alpha$

d) $\cos^2 \alpha + \sin^2 \alpha$

e) $2 \sin \alpha$

Answer: b

67. $\cos \alpha =$

a) $1 - 2 \sin^2 \frac{\alpha}{2}$

b) $2 \cos^2 \frac{\alpha}{2} + 1$

c) $2 \cos^2 \alpha - 1$

d) $2 \cos^2 \alpha + 1$

e) $1 - 2 \sin^2 \alpha$

Answer: a

68. $2 \sin^2\left(\frac{\alpha}{2}\right) =$

a) $1 + \cos \alpha$

b) $1 - \cos \alpha$

c) $1 + \sin \alpha$

d) $1 - \sin \alpha$

e) $1 - 2 \sin^2 \alpha$

Answer: b

69. $\tan(2\pi - \theta) = \underline{\hspace{2cm}}?$

a) $\cot \theta$

b) $-\cot \theta$

c) $\tan \theta$

d) $-\tan \theta$

e) $-\cot \theta$

Answer: d

70. $\text{Cos}(2\pi + \theta) = \underline{\hspace{2cm}}?$

- a) $\text{Sin } \theta$
- b) $-\text{Sin } \theta$
- c) $\text{Cos } \theta$
- d) $-\text{Cos } \theta$
- e) $\text{Cot } \theta$

Answer: c

71. $\text{Tan}(2\pi + \theta) = \underline{\hspace{2cm}}?$

- a) $\text{Cot } \theta$
- b) $-\text{Sin } \theta$
- c) $\text{Tan } \theta$
- d) $-\text{Tan } \theta$
- e) $-\text{Tan } \theta$

Answer: c

72. $\text{Sin}(2\pi + \theta) =$

- a) $\text{Sin } \theta$
- b) $-\text{Sin } \theta$
- c) $\text{Cos } \theta$
- d) $-\text{Cos } \theta$
- e) $-\text{Cosec } \theta$

Answer: a

73. $1 + \text{Cos}2\alpha =$

- a) $2\text{sin } \alpha$
- b) $2\text{cos } \alpha$
- c) $2\text{sec } \alpha$
- d) $2\text{sin}^2 \alpha$
- e) $2\text{cos}^2 \alpha$

Answer: e

74. $\text{Cos}2\alpha =$

- a) $1 + \text{cos } \alpha$
- b) $1\text{sin}^2 \alpha + 1$
- c) $2\text{cos}^2 \alpha - 1$
- d) $2\text{cos}^2 \alpha + 1$
- e) $\text{Cos}^2 \alpha - 1$

Answer: e

75. $\text{Sin}2\alpha =$

- a) $\text{Cos}^2 \alpha - \text{Sin}^2 \alpha$
- b) $2\text{Sin}^2 \alpha + 1$
- c) $2\text{Sin } \alpha \text{ Cos } \alpha$

d) $\text{Sin } \alpha \text{ Cos } \alpha$

e) $2\text{Cos}^2 \alpha - 1$

Answer: c

76. $\text{Cos}2\alpha =$

a) $\text{cos}^2 \alpha + \text{sin}^2 \alpha$

b) $2\text{sin}^2 \alpha + 1$

c) $2\text{sin}^2 \alpha - 1$

d) $2\text{cos}^2 \alpha + 1$

e) $2\text{cos}^2 \alpha - 1$

Answer: e

77. $\text{Sin } \alpha =$

a) $\pm \sqrt{\frac{1 - \text{cos } 2\alpha}{2}}$

b) $\pm \sqrt{\frac{1 + \text{cos } 2\alpha}{2}}$

c) $\pm \sqrt{\frac{1 + \text{sin } 2\alpha}{2}}$

d) $\pm \sqrt{\frac{1 - \text{sin } 2\alpha}{2}}$

e) $\pm \sqrt{\frac{1 + \text{sec } 2\alpha}{2}}$

Answer: a

78. $1 + \text{cos}4\alpha =$

a) $2\text{cos}^2 \alpha$

b) $4\text{sin}^2 \alpha$

c) $4\text{cos}^2 \alpha$

d) $2\text{sin}^2 2\alpha$

e) $2\text{cos}^2 2\alpha$

Answer: e

79. $1 - \text{cos}4\alpha =$

a) $2\text{cos}^2 \alpha$

b) $4\text{sin}^2 \alpha$

c) $4\text{cos}^2 \alpha$

d) $2\text{sin}^2 2\alpha$

e) $2\text{cos}^2 2\alpha$

Answer: d

80. $\text{Cos } \alpha =$

$$a) \pm \sqrt{\frac{1 - \cos 2\alpha}{2}}$$

$$b) \pm \sqrt{\frac{1 + \cos 2\alpha}{2}}$$

$$c) \pm \sqrt{\frac{1 + \sin 2\alpha}{2}}$$

$$d) \pm \sqrt{\frac{1 - \sin 2\alpha}{2}}$$

$$e) \pm \sqrt{\frac{1 + \sec 2\alpha}{2}}$$

Answer: b

$$81. \quad 1 - \cos 3\alpha =$$

$$a) 2 \cos^2 \left(\frac{3\alpha}{2} \right)$$

$$b) 2 \sin^2 \left(\frac{3\alpha}{2} \right)$$

$$c) \frac{3}{2} \cos^2 \left(\frac{3\alpha}{2} \right)$$

$$d) 2 \sin^2 2\alpha$$

$$e) 2 \cos^2 3\alpha$$

Answer: b

$$82. \quad 1 + \cos 6\alpha =$$

$$a) 3 \sin^2 \alpha$$

$$b) 2 \sin^2 3\alpha$$

$$c) 3 \sin^2 3\alpha$$

$$d) 2 \sin^2 2\alpha$$

$$e) 2 \cos^2 3\alpha$$

Answer: e

$$83. \quad 1 - \cos 5\alpha =$$

$$a) 2 \cos^2 \left(\frac{5\alpha}{2} \right)$$

$$b) 2 \sin^2 \left(\frac{5\alpha}{2} \right)$$

$$c) \frac{5}{2} \cos^2 \left(\frac{3\alpha}{2} \right)$$

$$d) 2 \sin^2 2\alpha$$

$$e) 2 \cos^2 3\alpha$$

Answer: b

$$84. \quad 1 + \cos 5\alpha =$$

$$a) 2 \cos^2 \left(\frac{5\alpha}{2} \right)$$

$$b) 2 \sin^2 \left(\frac{5\alpha}{2} \right)$$

$$c) \frac{5}{2} \cos^2 \left(\frac{3\alpha}{2} \right)$$

$$d) 2 \sin^2 2\alpha$$

$$e) 2 \cos^2 3\alpha$$

Answer: a

$$85. \quad 1 + \cos 3\alpha =$$

$$a) 2 \cos^2 \left(\frac{3\alpha}{2} \right)$$

$$b) \sin^2 \left(\frac{3\alpha}{2} \right)$$

$$c) \frac{3}{2} \cos^2 \left(\frac{3\alpha}{2} \right)$$

$$d) 2 \sin^2 2\alpha$$

$$e) 2 \cos^2 3\alpha$$

Answer: c

$$86. \quad \tan 2\alpha =$$

$$a) \frac{2 \tan^2 \alpha}{1 - \tan \alpha}$$

$$b) \frac{2 \tan \alpha}{1 - \tan^2 \alpha}$$

$$c) \frac{2 \tan \alpha}{1 - \tan^2 \alpha}$$

$$d) \frac{2 \cot \alpha}{1 + \cot^2 \alpha}$$

$$e) \frac{2 \cot \alpha}{1 - \cot^2 \alpha}$$

Answer: c

$$87. \quad \tan 4\alpha =$$

$$a) \frac{4 \tan^2 \alpha}{1 - \tan \alpha}$$

$$b) \frac{2 \tan 2\alpha}{1 + \tan^2 2\alpha}$$

$$c) \frac{2 \tan 2\alpha}{1 - \tan^2 2\alpha}$$

$$d) \frac{4 \tan 2\alpha}{1 - \tan^2 2\alpha}$$

$$e) \frac{4 \tan 2\alpha}{1 + \tan^2 2\alpha}$$

Answer: c

88. $\cos 3\alpha =$
- a) $4 \cos^3 \alpha - 3 \cos \alpha$
 - b) $3 \cos^3 \alpha - 4 \cos \alpha$
 - c) $3 \sin \alpha - 4 \sin^3 \alpha$
 - d) $4 \sin \alpha - 3 \sin^3 \alpha$
 - e) $3 \cos \alpha$

Answer: a

89. $\sin 3\alpha =$
- a) $4 \cos^3 \alpha - \cos \alpha$
 - b) $3 \cos^3 \alpha - 4 \cos \alpha$
 - c) $3 \sin \alpha - 4 \sin^3 \alpha$
 - d) $4 \sin \alpha - 3 \sin^3 \alpha$
 - e) $3 \cos \alpha$

Answer: c

90. $\tan 3\alpha =$
- a) $\frac{3 \tan \alpha - \tan^3 \alpha}{1 - 3 \tan^2 \alpha}$
 - b) $\frac{3 \tan \alpha + \tan^3 \alpha}{1 - 3 \tan^2 \alpha}$
 - c) $\frac{3 \tan \alpha - \tan^3 \alpha}{1 + 3 \tan^2 \alpha}$
 - d) $\frac{3 \cot \alpha - \cot^3 \alpha}{1 - 3 \cot^2 \alpha}$
 - e) $3 \tan \alpha$

Answer: a

91. $\sin 2\alpha =$
- a) $\frac{1 + \tan^2 \alpha}{1 - \tan^2 \alpha}$
 - b) $\frac{2 \tan \alpha}{1 - \tan^2 \alpha}$
 - c) $\frac{1 + \tan^2 \alpha}{1 - \tan^2 \alpha}$
 - d) $\frac{2 \tan \alpha}{1 + \tan^2 \alpha}$
 - e) $2 \sin \alpha$

Answer: d

92. $\cos 12\alpha$
- a) $3 \cos^3 \alpha - 4 \cos 4\alpha$
 - b) $4 \cos^3 4\alpha - 3 \cos 4\alpha$
 - c) $3 \sin 4\alpha - 4 \sin^3 4\alpha$
 - d) $4 \sin 4\alpha - 3 \sin^3 4\alpha$
 - e) $12 \cos \alpha$

Answer: b

93. $\sin 9\alpha$
- a) $4 \cos^3 \alpha - 3 \cos \alpha$
 - b) $3 \cos^3 3\alpha - 4 \cos 3\alpha$
 - c) $3 \sin 3\alpha - 4 \sin^3 3\alpha$
 - d) $4 \sin 3\alpha - 3 \sin^3 3\alpha$
 - e) $9 \cos \alpha$

Answer: c

94. $\cos 9\alpha$
- a) $4 \cos^3 \alpha - 3 \cos 3\alpha$
 - b) $3 \cos^3 3\alpha - 4 \cos 3\alpha$
 - c) $3 \sin 3\alpha - 4 \sin^3 3\alpha$
 - d) $4 \sin 3\alpha - 3 \sin^3 3\alpha$
 - e) $9 \cos \alpha$

Answer: e

95. $2 \cos \alpha \cos \beta =$
- a) $\cos(\alpha + \beta) + \cos(\alpha - \beta)$
 - b) $\cos(\alpha + \beta) - \cos(\alpha - \beta)$
 - c) $\sin(\alpha + \beta) + \sin(\alpha - \beta)$
 - d) $\sin(\alpha + \beta) - \sin(\alpha - \beta)$
 - e) None of these

Answer: a

96. $\cos 2\alpha =$
- a) $\frac{1 + \tan^2 \alpha}{1 - \tan^2 \alpha}$
 - b) $\frac{2 \tan \alpha}{1 - \tan^2 \alpha}$
 - c) $\frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha}$
 - d) $\frac{2 \tan \alpha}{1 + \tan^2 \alpha}$
 - e) $2 \sin \alpha$

Answer: c

97. $\cos 2\alpha =$
- a) $\cos(\alpha + \beta) + \cos(\alpha - \beta)$

- b) $\cos(\alpha + \beta) - \cos(\alpha - \beta)$
 c) $\sin(\alpha + \beta) + \sin(\alpha - \beta)$
 d) $\sin(\alpha + \beta) - \sin(\alpha - \beta)$
 e) None of these

Answer: c

98. $2\cos\alpha \sin\beta =$

- a) $\cos(\alpha + \beta) + \cos(\alpha - \beta)$
 b) $\cos(\alpha + \beta) - \cos(\alpha - \beta)$
 c) $\sin(\alpha + \beta) + \sin(\alpha - \beta)$
 d) $\sin(\alpha + \beta) - \sin(\alpha - \beta)$
 e) None of these

Answer: d

99. $2\sin\alpha \sin\beta =$

- a) $\cos(\alpha + \beta) + \cos(\alpha - \beta)$
 b) $\cos(\alpha - \beta) - \cos(\alpha + \beta)$
 c) $\sin(\alpha + \beta) + \sin(\alpha - \beta)$
 d) $\sin(\alpha + \beta) - \sin(\alpha - \beta)$
 e) None of these

Answer: b

100. $\cos\theta - \cos\phi =$

- a) $-2\sin\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$
 b) $2\sin\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$
 c) $2\sin\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$
 d) $2\cos\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$
 e) None of these

Answer: a

101. $\sin\theta + \sin\phi =$

- a) $-2\sin\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$
 b) $2\sin\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$
 c) $2\sin\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$
 d) $2\cos\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$
 e) None of these

Answer: c

102. $\sin\theta - \sin\phi =$

- a) $-2\sin\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$
 b) $2\sin\frac{\theta+\phi}{2}\sin\frac{\theta-\phi}{2}$
 c) $2\sin\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$
 d) $2\cos\frac{\theta+\phi}{2}\cos\frac{\theta-\phi}{2}$
 e) None of these

Answer: d

103. $\cos\frac{\pi}{12} =$

- a) $\frac{\sqrt{3}-1}{2\sqrt{2}}$
 b) $\frac{\sqrt{3}+1}{2\sqrt{2}}$
 c) $\frac{\sqrt{3}+1}{\sqrt{2}}$
 d) $\frac{\sqrt{3}-1}{\sqrt{2}}$
 e) 1

Answer: b

104. $\cos 315^\circ =$

- a) $\frac{1}{\sqrt{2}}$
 b) $-\frac{1}{\sqrt{2}}$
 c) $\frac{3}{\sqrt{2}}$
 d) $-\frac{3}{\sqrt{2}}$
 e) 0

Answer: a

105. $\cos 540^\circ =$

a) $\frac{1}{\sqrt{2}}$

b) $-\frac{1}{\sqrt{2}}$

c) $\frac{3}{\sqrt{2}}$

d) $-\frac{3}{\sqrt{2}}$

e) -1

Answer: e

106. $\tan(-135^\circ) =$

a) $\frac{1}{\sqrt{2}}$

b) $-\frac{1}{\sqrt{2}}$

c) $\frac{3}{\sqrt{2}}$

d) 1

e) 0

Answer: d

107. $\sec(-300^\circ) =$

a) 4

b) 3

c) 2

d) 1

e) 0

Answer: c

108. $\cot(-855^\circ) =$

a) 2

b) 1

c) -1

d) 0

e) -2

Answer: b

109. $\sec(-960^\circ) =$

a) 2

b) 1

c) -1

d) 0

e) -2

Answer: e

110. $\sin(-780^\circ) =$

a) $-\frac{\sqrt{3}}{2}$

b) $\frac{\sqrt{3}}{2}$

c) $\frac{2}{\sqrt{3}}$

d) 0

e) 1

Answer: a

111. $\cos 254^\circ =$

a) $-\cos 33^\circ$

b) $\cos 5^\circ$

c) $\cos 16^\circ$

d) $\sin 16^\circ$

e) $-\sin 16^\circ$

Answer: e

112. $\cos(-435^\circ) =$

a) $\cos 15^\circ$

b) $-\cos 15^\circ$

c) $-\sin 15^\circ$

d) $\sin 15^\circ$

e) $\sin 25^\circ$

Answer: d

113. $\sin(\alpha + \beta) \cdot \cos(\alpha - \beta) =$

a) $\sin \alpha - \sin \beta$

b) $\sin \alpha + \sin \beta$

c) $\sin^2 \alpha - \sin^2 \beta$

d) $\sin^2 \alpha - \sin^2 \beta + 1$

e) 0

Answer: d

114. $\sin(\alpha + \beta) \cdot \sin(\alpha - \beta) =$

a) $\sin \alpha - \sin \beta$

b) $\sin \alpha + \sin \beta$

c) $\sin^2 \alpha - \sin^2 \beta$

d) $\cos^2 \beta - \cos^2 \alpha$

e) 0

Answer: d

115. $\sin(45^\circ + \alpha) =$

- a) $\sin \alpha + \cos \alpha$
- b) $\sin \alpha - \cos \alpha$
- c) $\frac{1}{\sqrt{2}}(\sin \alpha + \cos \alpha)$
- d) $\frac{1}{\sqrt{2}}(\sin \alpha - \cos \alpha)$
- e) $\sin \alpha$

Answer: e

116. $\tan(180^\circ + \theta) =$

- a) $\cot \theta$
- b) $\tan \theta$
- c) $\sin \theta$
- d) $-\tan \theta$
- e) $-\cos \theta$

Answer: b

117. $\cos(\alpha + \beta) \cdot \cos(\alpha - \beta) =$

- a) $\cot 2\alpha$
- b) $\cos^2 \alpha - \cos^2 \beta$
- c) $\sin 2\alpha$
- d) $\tan 2\alpha$
- e) None of these

Answer: b

118. $\frac{\tan \alpha + \tan \beta}{\tan \alpha - \tan \beta}$

- a) $\frac{\cos(\alpha + \beta)}{\cos(\alpha - \beta)}$
- b) $\frac{\cos(\alpha - \beta)}{\cos(\alpha + \beta)}$
- c) $\frac{\sin(\alpha - \beta)}{\sin(\alpha + \beta)}$
- d) $\frac{\sin(\alpha + \beta)}{\sin(\alpha - \beta)}$
- e) $-\tan \alpha$

Answer: d

119. $\cos^4 \theta =$

- a) $\frac{1}{8}[3 - 4 \cos 2\theta + 2 \cos 4\theta]$

b) $\frac{1}{8}[3 + 4 \cos 2\theta + 2 \cos 4\theta]$

- c) $4 \sin^3 \theta \cos \theta$
- d) $-4 \cos^3 \theta \sin \theta$
- e) none of these

Answer: b

120. $\sqrt{\frac{1 + \sin \alpha}{1 - \sin \alpha}} =$

a) $\frac{\tan \frac{\alpha}{2} + \cos \frac{\alpha}{2}}{\tan \frac{\alpha}{2} - \cos \frac{\alpha}{2}}$

b) $\frac{\sin \frac{\alpha}{2} - \cos \frac{\alpha}{2}}{\sin \frac{\alpha}{2} + \cos \frac{\alpha}{2}}$

c) $\frac{\sin \frac{\alpha}{2} + \cos \frac{\alpha}{2}}{\sin \frac{\alpha}{2} - \cos \frac{\alpha}{2}}$

d) $\frac{\tan \frac{\alpha}{2} - \cos \frac{\alpha}{2}}{\tan \frac{\alpha}{2} + \cos \frac{\alpha}{2}}$

e) $4 \cos 4\alpha$

Answer: c

121. $\frac{\sin 3\theta}{\cos \theta} + \frac{\cos 3\theta}{\sin \theta} =$

- a) $\sin \theta$
- b) $2 \cot 2\theta$
- c) $\cos \theta$
- d) $-\sec \theta$
- e) $\sec \theta$

Answer: b

122. $2 \sin 3\theta \cos \theta =$

- a) $\cot 4\theta + \cot 2\theta$
- b) $\cos 4\theta + \cos 2\theta$
- c) $\cos 4\theta - \cos 2\theta$
- d) $\sin 4\theta - \sin 2\theta$
- e) $\sin 4\theta + \sin 2\theta$

Answer: e

123. $\sin 5\theta + \sin 3\theta =$

- a) $2\cos 2\theta \sin \theta$
- b) $-2\cos 4\theta \sin \theta$
- c) $-2\sin 4\theta \cos \theta$
- d) $2\cos 4\theta \sin \theta$
- e) $2\sin 4\theta \cos \theta$

Answer: e

124. $2\sin 12^\circ \sin 46^\circ =$

- a) $\cos 34^\circ \cos 58^\circ$
- b) $\sin 34^\circ + \sin 58^\circ$
- c) $\sin 34^\circ - \sin 58^\circ$
- d) $\cos 34^\circ + \cos 58^\circ$
- e) $\cos 34^\circ - \cos 58^\circ$

Answer: e

125. $\frac{\cos x - \cos 3x}{\sin 3x - \sin x} =$

- a) $\cot 2x$
- b) $\tan 2x$
- c) $\csc 2x$
- d) $\sec 2x$
- e) $\cos 2x$

Answer: b

126. $\csc(-\alpha) =$

- a) $-\cos \alpha$
- b) $-\sec \alpha$
- c) $\sec \alpha$
- d) $\csc \alpha$
- e) $-\csc \alpha$

Answer: e

127. $\cot(\alpha - 90^\circ) =$

- a) $\tan \alpha$
- b) $-\tan \alpha$
- c) $-\cot \alpha$
- d) $\cot \alpha$
- e) $\cos \alpha$

Answer: b

128. $\csc\left(\frac{\pi}{2} - \alpha\right) =$

- a) $-\csc \alpha$
- b) $\csc \alpha$
- c) $-\sec \alpha$
- d) $\sec \alpha$
- e) $\cot \alpha$

Answer: d

129. $\tan\left(\alpha + \frac{\pi}{2}\right) =$

- a) $\tan \alpha$
- b) $-\tan \alpha$
- c) $\cot \alpha$
- d) $-\cot \alpha$
- e) $\sec \alpha$

Answer: d

130. $\cot\left(\alpha + \frac{\pi}{2}\right) =$

- a) $\tan \alpha$
- b) $-\tan \alpha$
- c) $\cot \alpha$
- d) $-\cot \alpha$
- e) $\sec \alpha$

Answer: b

131. $\cos \alpha =$

- a) $1 - 2\sin^2 \frac{\alpha}{2}$
- b) $2\cos^2 \frac{\alpha}{2} + 1$
- c) $2\cos^2 \alpha - 1$
- d) $2\cos^2 \alpha + 1$
- e) $1 - 2\sin^2 \alpha$

Answer: a

132. $1 - \cos 2\alpha =$

- a) $2\sin \alpha$
- b) $2\cos \alpha$

- c) $2\sec \alpha$
- d) $2\sin^2 \alpha$
- e) $2\cos^2 \alpha$

Answer: d

133. $1 - \cos 6\alpha =$

- a) $3\sin^2 \alpha$
- b) $2\sin^2 3\alpha$
- c) $3\sin^2 3\alpha$
- d) $2\sin^2 2\alpha$
- e) $2\cos^2 3\alpha$

Answer: b

134. $\cos \theta + \cos \phi =$

- a) $-2\sin \frac{\theta + \phi}{2} \sin \frac{\theta - \phi}{2}$
- b) $2\sin \frac{\theta + \phi}{2} \sin \frac{\theta - \phi}{2}$
- c) $2\sin \frac{\theta + \phi}{2} \cos \frac{\theta - \phi}{2}$
- d) $2\cos \frac{\theta + \phi}{2} \cos \frac{\theta - \phi}{2}$
- e) none of these

Answer: d