

Unit #5: Graphs and Inverses of Trig Functions

Lesson #1: Unit Circle

In Problems 1–10, t is a real number and $P = (x, y)$ is the point on the unit circle that corresponds to t . Find the exact value of the six trigonometric functions of t .

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| 1. $\left(\frac{1}{4}, \frac{\sqrt{15}}{4}\right)$ | 2. $\left(\frac{3}{8}, \frac{\sqrt{55}}{8}\right)$ | 3. $\left(-\frac{2}{5}, \frac{\sqrt{21}}{5}\right)$ | 4. $\left(-\frac{1}{5}, \frac{2\sqrt{6}}{5}\right)$ |
| 5. $\left(-\frac{\sqrt{35}}{6}, -\frac{1}{6}\right)$ | 6. $\left(-\frac{\sqrt{39}}{8}, \frac{5}{8}\right)$ | 7. $\left(\frac{2\sqrt{2}}{3}, -\frac{1}{3}\right)$ | 8. $\left(-\frac{\sqrt{5}}{3}, -\frac{2}{3}\right)$ |
| 9. $\left(-\frac{3\sqrt{5}}{7}, \frac{2}{7}\right)$ | 10. $\left(-\frac{3\sqrt{11}}{10}, -\frac{1}{10}\right)$ | | |

In Problems 11–30, find the exact value of each expression. Do not use a calculator.

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| 11. $\sin 45^\circ + \cos 60^\circ$ | 12. $\sin 30^\circ - \cos 45^\circ$ | 13. $\sin 90^\circ + \tan 45^\circ$ |
| 14. $\cos 180^\circ - \sin 180^\circ$ | 15. $\sin 45^\circ \cos 45^\circ$ | 16. $\tan 45^\circ \cos 30^\circ$ |
| 17. $\csc 45^\circ \tan 60^\circ$ | 18. $\sec 30^\circ \cot 45^\circ$ | 19. $4 \sin 90^\circ - 3 \tan 180^\circ$ |
| 20. $5 \cos 90^\circ - 8 \sin 270^\circ$ | 21. $2 \sin \frac{\pi}{3} - 3 \tan \frac{\pi}{6}$ | 22. $2 \sin \frac{\pi}{4} + 3 \tan \frac{\pi}{4}$ |
| 23. $\sin \frac{\pi}{4} - \cos \frac{\pi}{4}$ | 24. $\tan \frac{\pi}{3} + \cos \frac{\pi}{3}$ | 25. $2 \sec \frac{\pi}{4} + 4 \cot \frac{\pi}{3}$ |
| 26. $3 \csc \frac{\pi}{3} + \cot \frac{\pi}{4}$ | 27. $\tan \pi - \cos 0^\circ$ | 28. $\sin \frac{3\pi}{2} + \tan \pi$ |
| 29. $\csc \frac{\pi}{2} + \cot \frac{\pi}{2}$ | 30. $\sec \pi - \csc \frac{\pi}{2}$ | |

In Problems 31–52, find the exact value of the six trigonometric functions of the given angle. If any are not defined, say “not defined.” Do not use a calculator.

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| 31. $\frac{2\pi}{3}$ | 32. $\frac{5\pi}{6}$ | 33. 210° | 34. 240° |
| 35. $\frac{5\pi}{3}$ | 36. $\frac{11\pi}{6}$ | 37. $7\pi/3$ | 38. $13\pi/6$ |
| 39. 405° | 40. 390° | 41. $-\pi/6$ | 42. $-\pi/3$ |
| 43. -45° | 44. -60° | 45. $5\pi/2$ | 46. 3π |
| 47. -180° | 48. -270° | 49. $-\pi/2$ | 50. -5π |
| 51. 480° | 52. -150° | | |