

Answer Key: Chapter 2 - Trigonometric Angles

Objective: Solutions are checked for mathematical accuracy. Equivalent exact forms are acceptable where appropriate.

1. Answer: $\frac{1}{2}$ <i>Work:</i> Special angle 30° .	2. Answer: $\frac{1}{2}$ <i>Work:</i> Special angle 60° .
3. Answer: 1 <i>Work:</i> $\tan 45^\circ = 1$.	4. Answer: 2 <i>Work:</i> Reciprocal of $\sin 30^\circ = \frac{1}{2}$.
5. Answer: 2 <i>Work:</i> Reciprocal of $\cos 60^\circ = \frac{1}{2}$.	6. Answer: 1 <i>Work:</i> Reciprocal of $\tan 45^\circ = 1$.
7. Answer: $\frac{\sqrt{3}}{2}$ <i>Work:</i> Reference angle 60° ; sine is positive in QII.	8. Answer: $-\frac{\sqrt{2}}{2}$ <i>Work:</i> Reference angle 45° ; cosine is negative in QII.
9. Answer: $-\frac{\sqrt{3}}{3}$ <i>Work:</i> Reference angle 30° ; tangent is negative in QII.	10. Answer: $-\frac{\sqrt{2}}{2}$ <i>Work:</i> Reference angle 45° ; sine is negative in QIII.

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11. Answer: $\frac{1}{2}$ <i>Work:</i> Reference angle 60° ; cosine is positive in QIV.	12. Answer: $-\frac{\sqrt{3}}{3}$ <i>Work:</i> Reference angle 30° ; tangent is negative in QIV.
13. Answer: -2 <i>Work:</i> $\cos 120^\circ = -\frac{1}{2}$, then take the reciprocal.	14. Answer: -1 <i>Work:</i> $\sin 270^\circ = -1$.
15. Answer: -1 <i>Work:</i> At 315° , $\cos/\sin = -1$.	16. Answer: $\frac{1}{2}$ <i>Work:</i> $\pi/6 = 30^\circ$.
17. Answer: $-\frac{1}{2}$ <i>Work:</i> $2\pi/3 = 120^\circ$.	18. Answer: -1 <i>Work:</i> $3\pi/4 = 135^\circ$.
19. Answer: 2 <i>Work:</i> $\sin(5\pi/6) = \frac{1}{2}$.	20. Answer: $\sqrt{2}$ <i>Work:</i> $\cos(7\pi/4) = \frac{\sqrt{2}}{2}$; reciprocal is $\sqrt{2}$.

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21. Answer: $-\sqrt{3}$ <i>Work:</i> $\cot(11\pi/6) = \frac{\cos}{\sin} = -\sqrt{3}$.	22. Answer: $-\frac{\sqrt{3}}{2}$ <i>Work:</i> $5\pi/3 = 300^\circ$.
23. Answer: $-\frac{1}{2}$ <i>Work:</i> $4\pi/3 = 240^\circ$.	24. Answer: $\frac{\sqrt{3}}{3}$ <i>Work:</i> $7\pi/6 = 210^\circ$; tangent is positive in QIII.
25. Answer: Undefined <i>Work:</i> $\cos(3\pi/2) = 0$, so $\sec = 1/0$ is undefined.	26. Answer: 30° <i>Work:</i> $210^\circ - 180^\circ = 30^\circ$.
27. Answer: 45° <i>Work:</i> $360^\circ - 315^\circ = 45^\circ$.	28. Answer: $\frac{\pi}{6}$ <i>Work:</i> $\frac{7\pi}{6} - \pi = \frac{\pi}{6}$.
29. Answer: $\frac{\pi}{4}$ <i>Work:</i> $\frac{5\pi}{4} - \pi = \frac{\pi}{4}$.	30. Answer: $\frac{\pi}{6}$ <i>Work:</i> $2\pi - \frac{11\pi}{6} = \frac{\pi}{6}$.

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31. Answer: 45° <i>Work:</i> $765^\circ - 720^\circ = 45^\circ$.	32. Answer: 210° <i>Work:</i> $-150^\circ + 360^\circ = 210^\circ$.
33. Answer: $\frac{7\pi}{6}$ <i>Work:</i> $\frac{19\pi}{6} - 2\pi = \frac{7\pi}{6}$.	34. Answer: $\frac{\pi}{4}$ <i>Work:</i> $-\frac{7\pi}{4} + 2\pi = \frac{\pi}{4}$.
35. Answer: $\frac{\pi}{6}$ <i>Work:</i> $\frac{25\pi}{6} - 4\pi = \frac{\pi}{6}$.	36. Answer: $\frac{1}{2}$ <i>Work:</i> Sine is positive in Quadrant II.
37. Answer: $-\frac{\sqrt{2}}{2}$ <i>Work:</i> Cosine is negative in Quadrant III.	38. Answer: $-\sqrt{3}$ <i>Work:</i> Tangent is negative in Quadrant IV.
39. Answer: -2 <i>Work:</i> Sine is negative in Quadrant III; $\csc = 1/(-1/2) = -2$.	40. Answer: $-\sqrt{2}$ <i>Work:</i> Cosine is negative in Quadrant II; reciprocal of $-\frac{\sqrt{2}}{2}$.

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41. Answer: 1 <i>Work:</i> $\frac{1}{2} + \frac{1}{2} = 1$.	42. Answer: 1 <i>Work:</i> $2 \left(\frac{\sqrt{2}}{2} \right)^2 = 1$.
43. Answer: 2 <i>Work:</i> $1 \cdot 2 = 2$.	44. Answer: $\frac{1}{4}$ <i>Work:</i> $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$.
45. Answer: $\frac{1}{2}$ <i>Work:</i> $\left(-\frac{\sqrt{2}}{2} \right)^2 = \frac{1}{2}$.	46. Answer: 1 <i>Work:</i> Pythagorean identity at 60° .
47. Answer: 1 <i>Work:</i> A trig function times its reciprocal equals 1.	48. Answer: 0 <i>Work:</i> $-2 + 2 = 0$.
49. Answer: 0 <i>Work:</i> $-\frac{1}{2} - \left(-\frac{1}{2} \right) = 0$.	50. Answer: 1 <i>Work:</i> $2 \left(\frac{\sqrt{2}}{2} \right) \left(\frac{\sqrt{2}}{2} \right) = 1$.