

More Practice with Trigonometric Functions

Name Master E
Date _____ Block _____

1-8: Find the smallest positive and smallest negative coterminal angle for each given angle.

- | | | | |
|--|---|--|---|
| 1. 30°
± 360 | 2. 300°
± 360 | 3. 80°
± 360 | 4. -170°
± 360 |
| 5. $\frac{23\pi}{4}$
$\pm 8\frac{\pi}{4}$ | 6. $-\frac{\pi}{3}$
$\pm 6\frac{\pi}{3}$ | 7. $-\frac{11\pi}{6}$
$\pm 12\frac{\pi}{6}$ | 8. $\frac{7\pi}{4}$
$\pm 8\frac{\pi}{4}$ |

9-29: Find the exact value of each indicated function without using a calculator.

- | | | |
|---|---|---|
| 9. $\cos(-225^\circ)$ | 10. $\sin \frac{17\pi}{3} = \sin \frac{5\pi}{3} = -\frac{\sqrt{3}}{2}$ | 11. $\tan(-720^\circ) = \tan 0 = 0$ |
| 12. $\cot \frac{11\pi}{3} = \cot \frac{5\pi}{3} = \frac{1}{-\frac{\sqrt{3}}{2}} = -\frac{2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$ | 13. $\csc 300^\circ = \frac{1}{\sin 300^\circ} = \frac{1}{-\frac{\sqrt{3}}{2}} = -\frac{2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$ | 14. $\sec 225^\circ = \frac{1}{\cos 225^\circ} = \frac{1}{-\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}} = -\sqrt{2}$ |
| 15. $\tan 405^\circ = \tan 45^\circ = 1$ | 16. $\sin\left(-\frac{7\pi}{6}\right) = -\frac{1}{2}$ | 17. $\csc \frac{11\pi}{4} = \csc \frac{3\pi}{4} = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$ |
| 18. $\cot \frac{5\pi}{4} = 1$ | 19. $\sec 510^\circ = \sec 150^\circ = \frac{1}{\cos 150^\circ} = \frac{1}{-\frac{\sqrt{3}}{2}} = -\frac{2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$ | 20. $\cos -270^\circ = 0$ |
| 21. $\tan -45^\circ = -1$ | 22. $\sec 450^\circ = \sec 90^\circ = \frac{1}{0} = \text{undefined}$ | 23. $\sin 32\pi = \sin 2\pi = 0$ |
| 24. $\csc 15\pi = \csc \pi = \frac{1}{0} = \text{undefined}$ | 25. $\cot \frac{19\pi}{6} = \cot \frac{7\pi}{6} = \frac{\cos 7\pi/6}{\sin 7\pi/6} = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\sqrt{3}$ | 26. $\cos \frac{7\pi}{6} = -\frac{\sqrt{3}}{2}$ |
| 27. $\cot \frac{7\pi}{2} = \cot \frac{3\pi}{2} = \frac{0}{-1} = 0$ | 28. $\csc\left(-\frac{5\pi}{6}\right) = \frac{1}{\sin(-5\pi/6)} = \frac{1}{-\frac{1}{2}} = -2$ | 29. $\cos -\frac{10\pi}{3} = \cos \frac{2\pi}{3} = \frac{1}{2}$ |

30-44: Find each exact value without using a calculator.


30. $\cos^{-1}\left(-\frac{1}{2}\right) = 120^\circ$

31. $\sin\left(\arctan\frac{\sqrt{3}}{3}\right) = \frac{1}{2}$

32. $\cos\left(\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right) - \frac{\pi}{2}\right) = \frac{\sqrt{2}}{2}$
 $\cos(135 - 90) = \cos 45$

33. $\sin\left(\sin^{-1}\frac{1}{2}\right) = \frac{1}{2}$

34. $\cos\left(\arcsin\frac{3}{5}\right) = \frac{4}{5}$

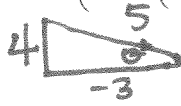


35. $\sin\left(2\sin^{-1}\frac{1}{2}\right) = \frac{\sqrt{3}}{2}$
 $\sin(2 \cdot 30) = \sin 60$

36. $\sin^{-1}\left(\cos\frac{\pi}{2}\right) = \sin^{-1}(0) = 0^\circ$

37. $\tan(\arctan 3) = 3$

38. $\tan\left(\cos^{-1}\left(-\frac{3}{5}\right)\right) = -\frac{4}{3}$



39. $\tan^{-1}(-1) = -45^\circ$

40. $\sin^{-1}\left(\tan\frac{\pi}{4}\right) = \sin^{-1}(1) = 90^\circ$

41. $\sin\left(\sin^{-1}\frac{\sqrt{3}}{2}\right) = \frac{\sqrt{3}}{2}$

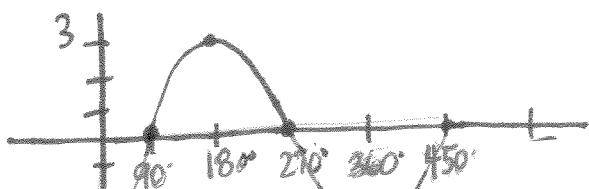
42. $\sin\frac{\pi}{6} = \frac{1}{2}$

43. $\arctan\sqrt{3} = 60^\circ$

44. $\sin\left(\arctan(-\sqrt{3})\right) = \sin(-60^\circ) = -\frac{\sqrt{3}}{2}$

45-48: Graph each function. State the domain, range, period, amplitude, phase and vertical shifts, and equation of the midline.

45. $y = 3\sin(x - 90^\circ)$

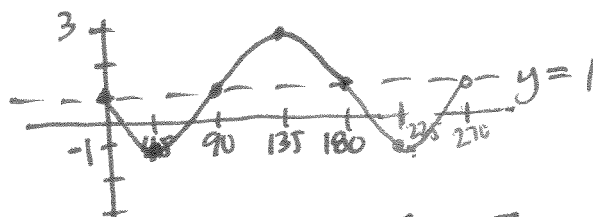


D: $(-\infty, \infty)$ R: $[-3, 3]$

Period: 360° Amp: 3

PS: 90° VS: 0 ML: $y=0$

46. $y = -2\cos 2(x - 45^\circ) + 1$

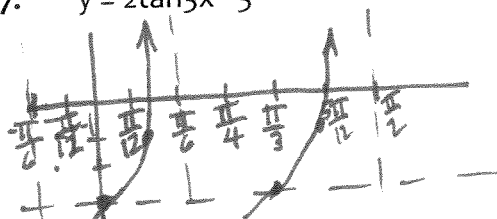


D: $(-\infty, \infty)$ R: $[-1, 3]$

Period: 180 Amp: 2

PS: 45° VS: 1 ML: $y=1$

47. $y = 2\tan 3x - 3$



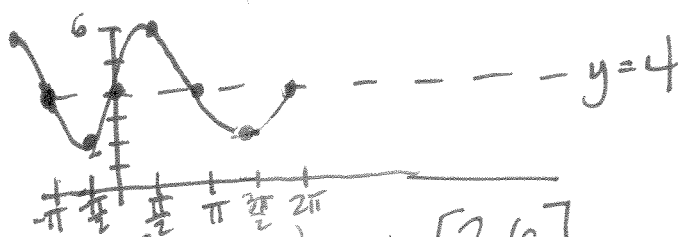
D: $\mathbb{R} \setminus \left\{ \frac{\pi}{6} + \frac{\pi n}{3} \right\}$ R: \mathbb{R}

Period: $\frac{\pi}{3}$ Amp: N/A

PS: None VS: -3 ML: $y=-3$

$\rightarrow \mathbb{R} \setminus \left\{ \frac{\pi}{6} + \frac{\pi n}{3} \right\}$

48. $y = -2\sin(x + \pi) + 4$



D: $(-\infty, \infty)$ R: $[2, 6]$

Period: 2π Amp: 2

PS: $-\pi$ VS: 4 ML: $y=4$