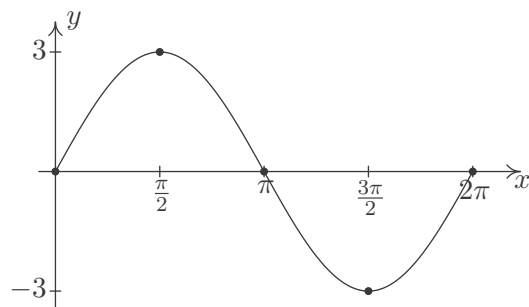
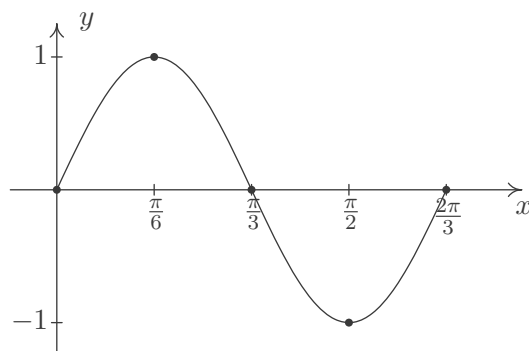


Worksheet 15 KEY - Graphing Trigonometric Functions

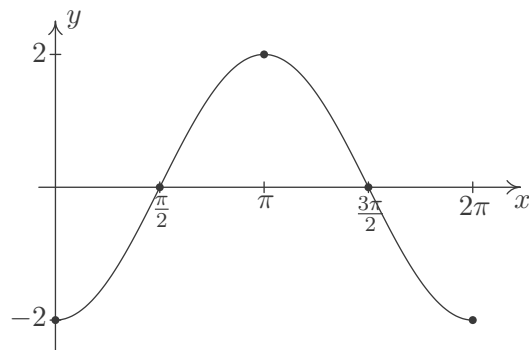
1. $y = 3 \sin(x)$
 Period: 2π
 Amplitude: 3
 Phase Shift: 0
 Vertical Shift: 0



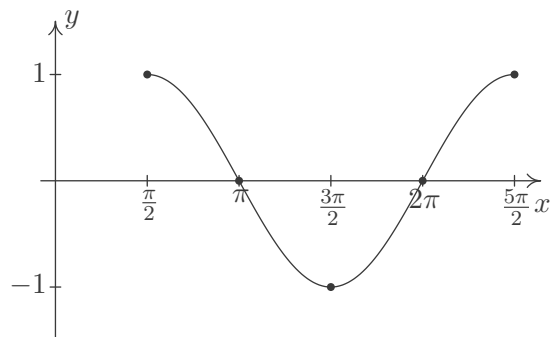
2. $y = \sin(3x)$
 Period: $\frac{2\pi}{3}$
 Amplitude: 1
 Phase Shift: 0
 Vertical Shift: 0



3. $y = -2 \cos(x)$
 Period: 2π
 Amplitude: 2
 Phase Shift: 0
 Vertical Shift: 0



4. $y = \cos\left(x - \frac{\pi}{2}\right)$
 Period: 2π
 Amplitude: 1
 Phase Shift: $\frac{\pi}{2}$
 Vertical Shift: 0



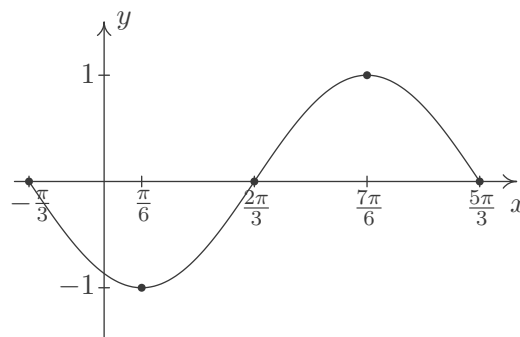
5. $y = -\sin\left(x + \frac{\pi}{3}\right)$

Period: 2π

Amplitude: 1

Phase Shift: $-\frac{\pi}{3}$

Vertical Shift: 0



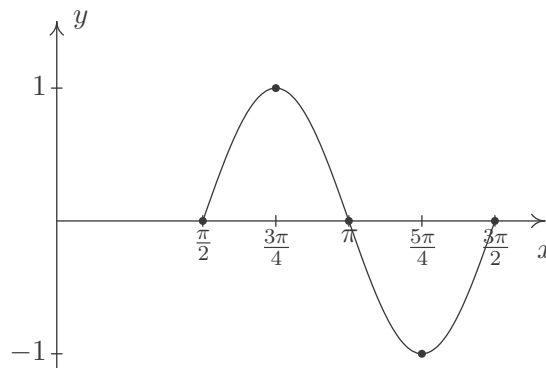
6. $y = \sin(2x - \pi)$

Period: π

Amplitude: 1

Phase Shift: $\frac{\pi}{2}$

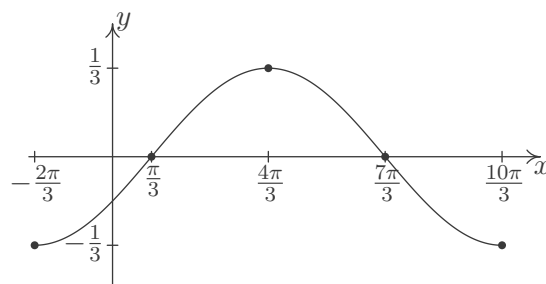
Vertical Shift: 0



7. $y = -\frac{1}{3}\cos\left(\frac{1}{2}x + \frac{\pi}{3}\right)$

Period: 4π Amplitude: $\frac{1}{3}$ Phase Shift: $-\frac{2\pi}{3}$

Vertical Shift: 0



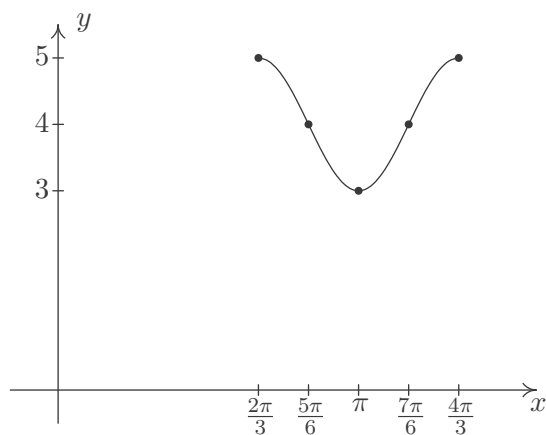
8. $y = \cos(3x - 2\pi) + 4$

Period: $\frac{2\pi}{3}$

Amplitude: 1

Phase Shift: $\frac{2\pi}{3}$

Vertical Shift: 4



9. $y = \sin\left(-x - \frac{\pi}{4}\right) - 2$

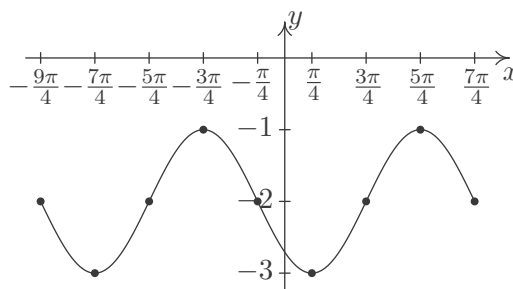
Period: 2π

Amplitude: 1

Phase Shift: $-\frac{\pi}{4}$ (You need to use

$y = -\sin\left(x + \frac{\pi}{4}\right) - 2$ to find this.)¹

Vertical Shift: -2



10. $y = \frac{2}{3} \cos\left(\frac{\pi}{2} - 4x\right) + 1$

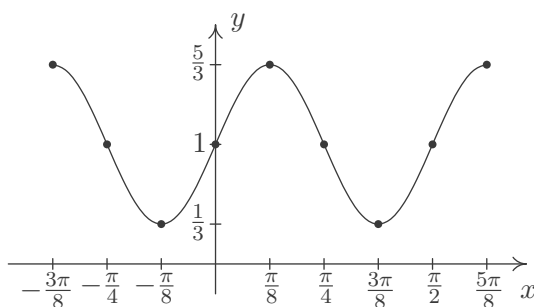
Period: $\frac{\pi}{2}$

Amplitude: $\frac{2}{3}$

Phase Shift: $\frac{\pi}{8}$ (You need to use

$y = \frac{2}{3} \cos\left(4x - \frac{\pi}{2}\right) + 1$ to find this.)²

Vertical Shift: 1



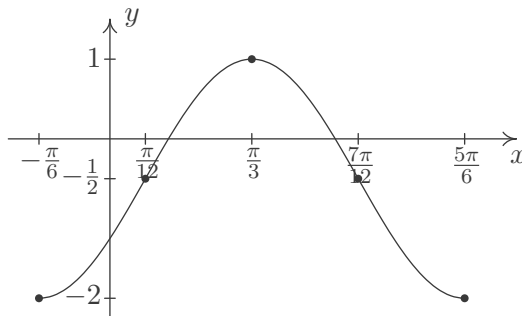
11. $y = -\frac{3}{2} \cos\left(2x + \frac{\pi}{3}\right) - \frac{1}{2}$

Period: π

Amplitude: $\frac{3}{2}$

Phase Shift: $-\frac{\pi}{6}$

Vertical Shift: $-\frac{1}{2}$



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

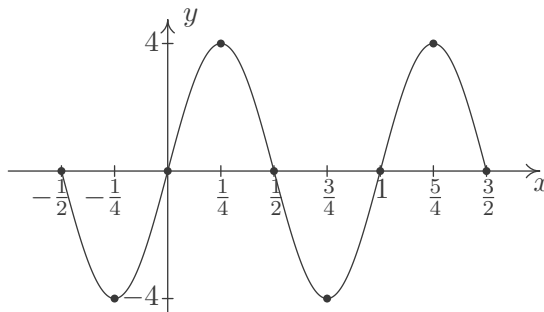
Period: 1

Amplitude: 4

Phase Shift: $\frac{1}{2}$ (You need to use

$y = -4 \sin(2\pi x - \pi)$ to find this.)³

Vertical Shift: 0

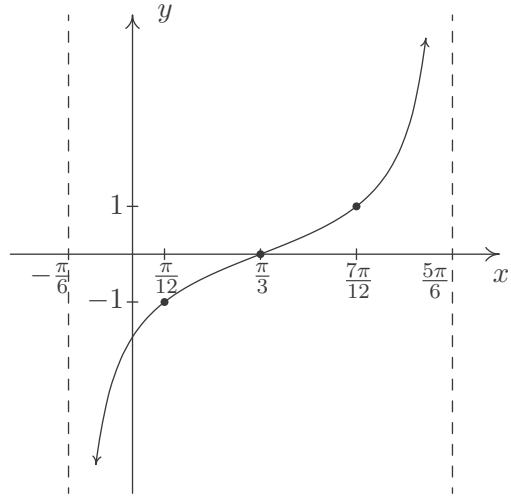


¹ Two cycles of the graph are shown to illustrate the phase shift.

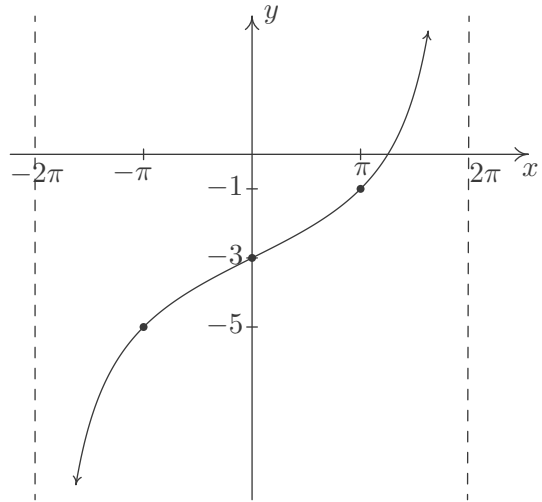
² Again, we graph two cycles to illustrate the phase shift.

³ This will be the last time we graph two cycles to illustrate the phase shift.

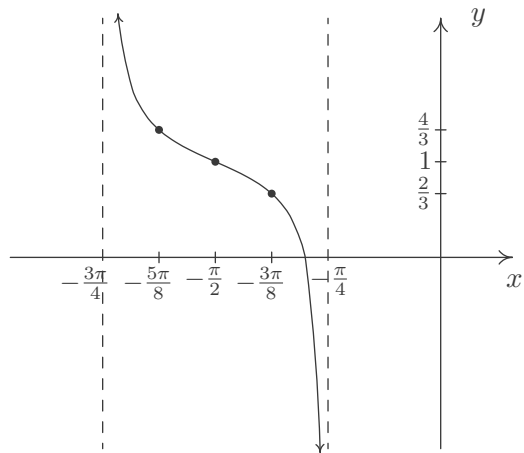
13. $y = \tan\left(x - \frac{\pi}{3}\right)$
 Period: π



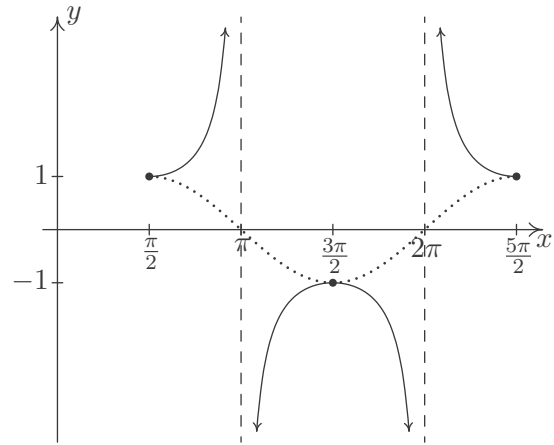
14. $y = 2 \tan\left(\frac{1}{4}x\right) - 3$
 Period: 4π



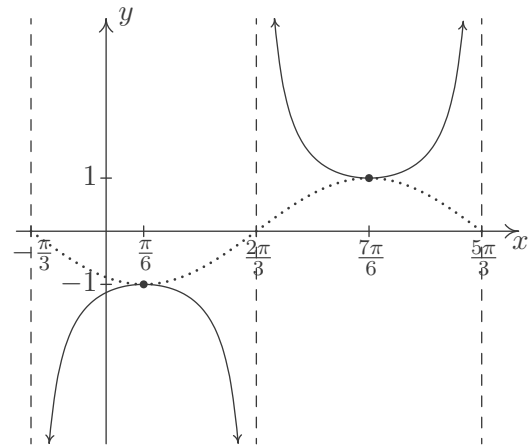
15. $y = \frac{1}{3} \tan(-2x - \pi) + 1$
 is equivalent to
 $y = -\frac{1}{3} \tan(2x + \pi) + 1$
 via the Even / Odd identity for tangent.
 Period: $\frac{\pi}{2}$



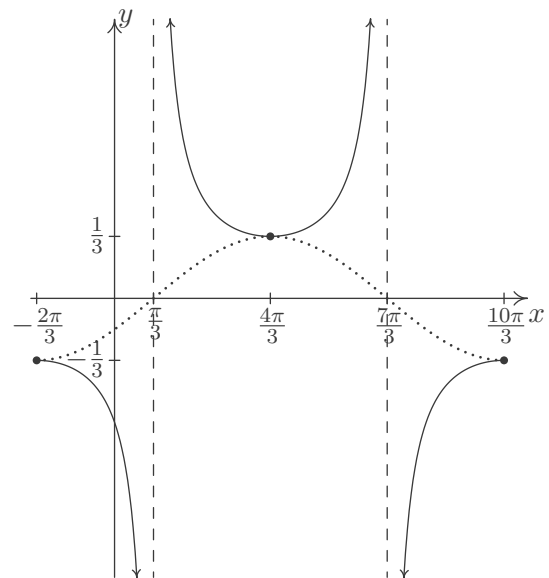
16. $y = \sec\left(x - \frac{\pi}{2}\right)$
 Start with $y = \cos\left(x - \frac{\pi}{2}\right)$
 Period: 2π



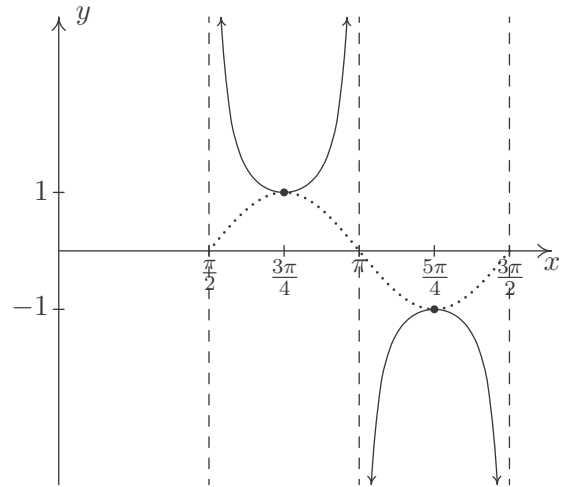
17. $y = -\csc\left(x + \frac{\pi}{3}\right)$
 Start with $y = -\sin\left(x + \frac{\pi}{3}\right)$
 Period: 2π



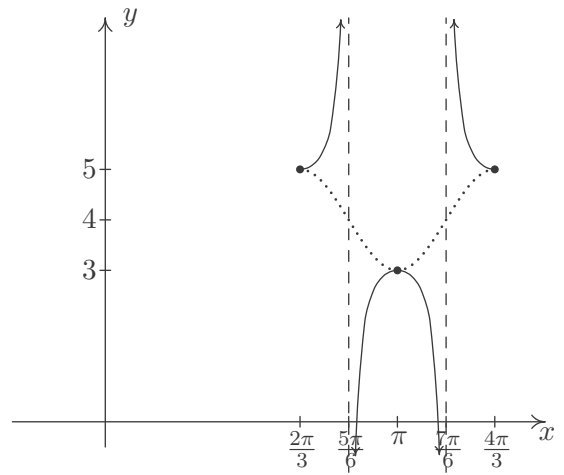
18. $y = -\frac{1}{3}\sec\left(\frac{1}{2}x + \frac{\pi}{3}\right)$
 Start with $y = -\frac{1}{3}\cos\left(\frac{1}{2}x + \frac{\pi}{3}\right)$
 Period: 4π



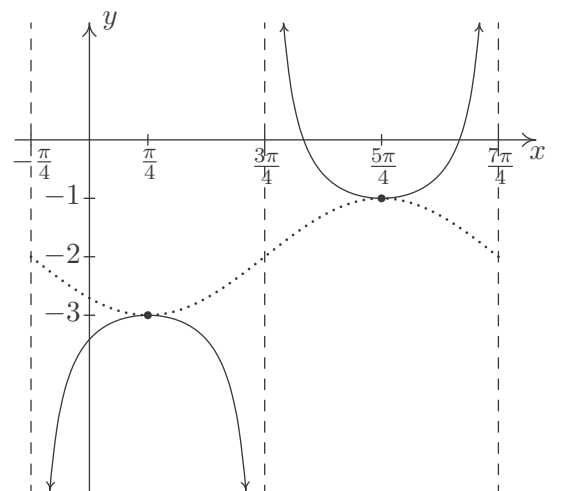
19. $y = \csc(2x - \pi)$
 Start with $y = \sin(2x - \pi)$
 Period: π



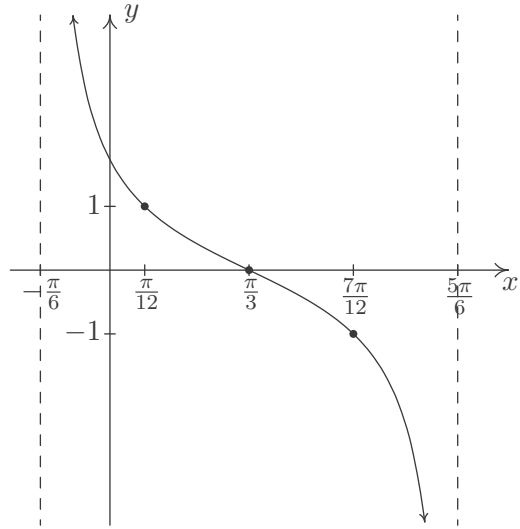
20. $y = \sec(3x - 2\pi) + 4$
 Start with $y = \cos(3x - 2\pi) + 4$
 Period: $\frac{2\pi}{3}$



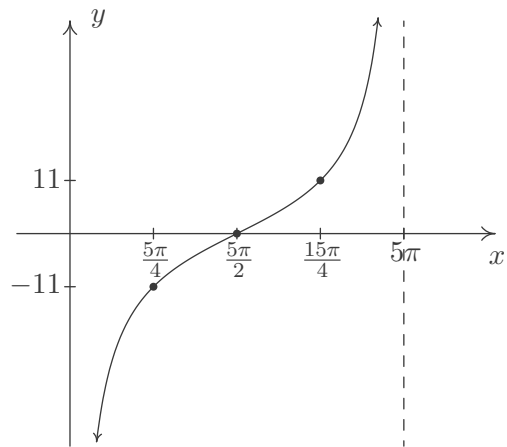
21. $y = \csc\left(-x - \frac{\pi}{4}\right) - 2$
 Start with $y = \sin\left(-x - \frac{\pi}{4}\right) - 2$
 Period: 2π



22. $y = \cot\left(x + \frac{\pi}{6}\right)$
 Period: π



23. $y = -11 \cot\left(\frac{1}{5}x\right)$
 Period: 5π



24. $y = \frac{1}{3} \cot\left(2x + \frac{3\pi}{2}\right) + 1$
 Period: $\frac{\pi}{2}$

