

Describe the transformation(s) of the following equations.

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

- Reflected x-axis
- Down 2
- Right $\frac{\pi}{4}$

2) $y = 3 \tan \frac{1}{2}x + 4$

- Vertically Stretched by 3
- Horizontally stretch by 2
- Up 4

3) $y = 2 \sin(3x + 3\pi)$

- Vertically Stretched by 2
- Horizontally Compressed by $\frac{1}{3}$
- Left π

4) $y = 8 \csc\left(8x - \frac{3\pi}{2}\right) - 3$

- Vertically stretched by 8
- Horizontally Compressed by $\frac{1}{8}$
- Right $\frac{3\pi}{16}$
- Down 3

5) $y = 3 \sec\left(\frac{12}{7}\left(x + \frac{5\pi}{12}\right)\right)$

- Vertically stretched by 3
- Horizontally Compressed by $\frac{7}{12}$
- Left $\frac{5\pi}{12}$

6) $y = -\frac{1}{2} \cot(2x - \pi)$

- Reflected x-axis
- Vertically stretch by $\frac{1}{2}$
- Horizontally Compressed by $\frac{1}{2}$
- Right $\frac{\pi}{2}$

Use the given information to identify the necessary parts of the graph.

7) $y = 4 \cos \frac{1}{2}(x + 4\pi)$

Amplitude: 4 Period: 4π
 Phase Shift: Left 4π
 Vertical Shift: None

8) $y = 3 \tan \frac{1}{2}x + 4$

Amplitude: DNE Period: 2π
 Phase Shift: DNE
 Vertical Shift: Up 4

9) $y = \frac{9}{5} \sin\left(-\frac{3}{2}x\right)$

Amplitude: $\frac{9}{5}$ Period: $\frac{4}{3}$
 Phase Shift: DNE
 Vertical Shift: DNE

10) $y = \frac{1}{2} \sin 6x - 4$

$\frac{1}{2} \sin 6(x - 0) - 4$

Amplitude: $\frac{1}{2}$ Period: $\frac{\pi}{3}$
 Phase Shift: DNE
 Vertical Shift: Down 4

11) $y = 7 \sin\left(\frac{1}{2}x - \frac{\pi}{6}\right)$

$Y = 7 \sin\left(\frac{1}{2}x - \frac{\pi}{6}\right)$

Amplitude: 7 Period: 4π
 Phase Shift: Right $\frac{\pi}{3}$
 Vertical Shift: DNE

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

$Y = -2 \sin(6x + \pi)$

Amplitude: 2 Period: $\frac{\pi}{3}$
 Phase Shift: Left $\frac{\pi}{6}$
 Vertical Shift: DNE

Use the information to determine the graph.

13) Write an equation of a sine graph with the amplitude of 2, a period of $\frac{2\pi}{5}$, and a vertical shift of up 1

$Y = 2 \sin 5(x) + 1$

14) Write an equation of a cosine graph with the amplitude of 2, period of π , and phase shift is right at $\frac{7}{2}$

$Y = 2 \cos 2\left(x - \frac{7}{2}\right)$

15) Write an equation of a tangent line with $a = 3$, period of 3, period shift of $\frac{3}{4}$ left, and vertical shift of down 3, reflected across the x-axis.

$Y = -3 \tan \frac{\pi}{3} \left(x + \frac{3}{4}\right) - 3$