1. Graph by using transformations.

a) \( y = -\sin(x + \pi / 4) + 2 \)

b) \( y = 2\cos\left(\frac{\pi}{2} - 2x\right) \)
   \[= 2\cos\left[-2\left(x - \frac{\pi}{4}\right)\right]\]
   \[= 2\cos\left[2\left(x - \frac{\pi}{4}\right)\right]\]

c) \( y = -\tan(3x + \pi) \)
   \[= -\tan\left[3\left(x - \frac{\pi}{3}\right)\right]\]
2. Describe the transformations involved.

\[ y = -4 \sin \left( \frac{\pi}{2} - 3x \right) + 5 \]

- Reflection in the x-axis
- Vertical expansion by a factor of 4
- Reflection in the y-axis
- Horizontal compression by a factor of 4
- Horizontal shift to the right by \( \frac{\pi}{6} \)
- Vertical shift upward by 5

3. Write the equation of the trigonometric function \( y = \cos x \) after the following transformations:

- Reflection in the x-axis
- Vertical compression by 0.5
- Reflection in the y-axis
- Horizontal expansion by 3
- Horizontal shift to the left by \( \frac{\pi}{2} \)
- Vertical shift down by 4

\[ y = -\frac{1}{2} \cos \left( -\frac{1}{3} \left( x + \frac{\pi}{2} \right) \right) - 4 \]

4. Graph the following function by using a method at your convenience.

\[ y = -3 \cos \left( \frac{\pi}{2} - 3x \right) + 2 \]

**Graph Details:**
- Amplitude: 3
- Frequency: \( \frac{\pi}{3} \)
- Wavelength: \( \frac{2\pi}{3} \)
- Phase Shift: \( \frac{\pi}{6} \)
- Vertical Shift: 2
- Vertical Compression: 0.5

**Graph Equation:**

\[ y = -3 \cos \left[ -3 \left( x - \frac{\pi}{6} \right) \right] + 2 \]
5. Match the equations on the left to the graphs on the right. Some equations may not have a corresponding graph.

a) $y = -\sin(x + \pi/2) - 1$  
   ![Graph 1]

b) ×  
   $y = -\sin(x + \pi/2)$

![Graph 2]

c) $y = \sin(x - \pi/2) + 1$  
   ![Graph 3]

d) $y = -\sin x + 2$  
   ![Graph 4]

e) ×  
   $y = -\sin x - 2$

![Graph 5]

f) $y = \sin(x + \pi/2) - 2$  
   ![Graph 6]