

Graphing trig functions:

$$y = A \sin(Bx-C) + D, \quad y = A \cos(Bx-C) + D, \quad y = A \tan(Bx-C) + D$$

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1. Write the function in the general form noted above and identify a, b, c, and d.
2. Find the **amplitude**: $a = |A|$
3. **Vertical position**: Sketch 2 horizontal dotted lines: $y_U = d + a$ and $y_L = d - a$

These represent the upper and lower boundaries of sine and/or cosine functions or the locations on the tangent function where it equals 1.

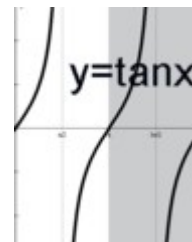
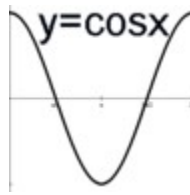
4. Find the period: $p = |2\pi / B|$ for sine & cosine, or $p = |\pi / B|$ for tangent

The period indicates the distance along the x-axis for one complete cycle of the function.

5. **Horizontal position**: Sketch 2 vertical dotted lines: $x_L = 0 + C/B$ and $x_R = p + C/B$

These represent the start and end locations along the x-axis for one period of the given function.

6. Staying within the rectangular region bounded by the dotted lines, sketch the graph of the function, using the sign of **A** and the base pattern of the relevant curve as reference:



7. Continue the sketch to the right and to the left following the pattern of the reference function.
8. a) Check to be sure that you have B cycles along the x-axis for a distance of:
 2π for sine and cosine (period of $y = \sin x$ and $y = \cos x$), or
 π for tangent (period of $y = \tan x$)
b) Check the sign of A. If it is negative be sure the pattern is reflected across the horizontal axis of the function.