5.2 Transformations of Sinusoidal Functions

**Amplitude:**

**Phase shift:**

Bx – c = 0 b(x - c)=0

X=

**Period**: Horizontal Stretch of 1/b

**Vertical Displacement**: d, d

**y = a Sin b(x-c) + d**

Vertical Displacement

Phase shift

Horizontal Stretch

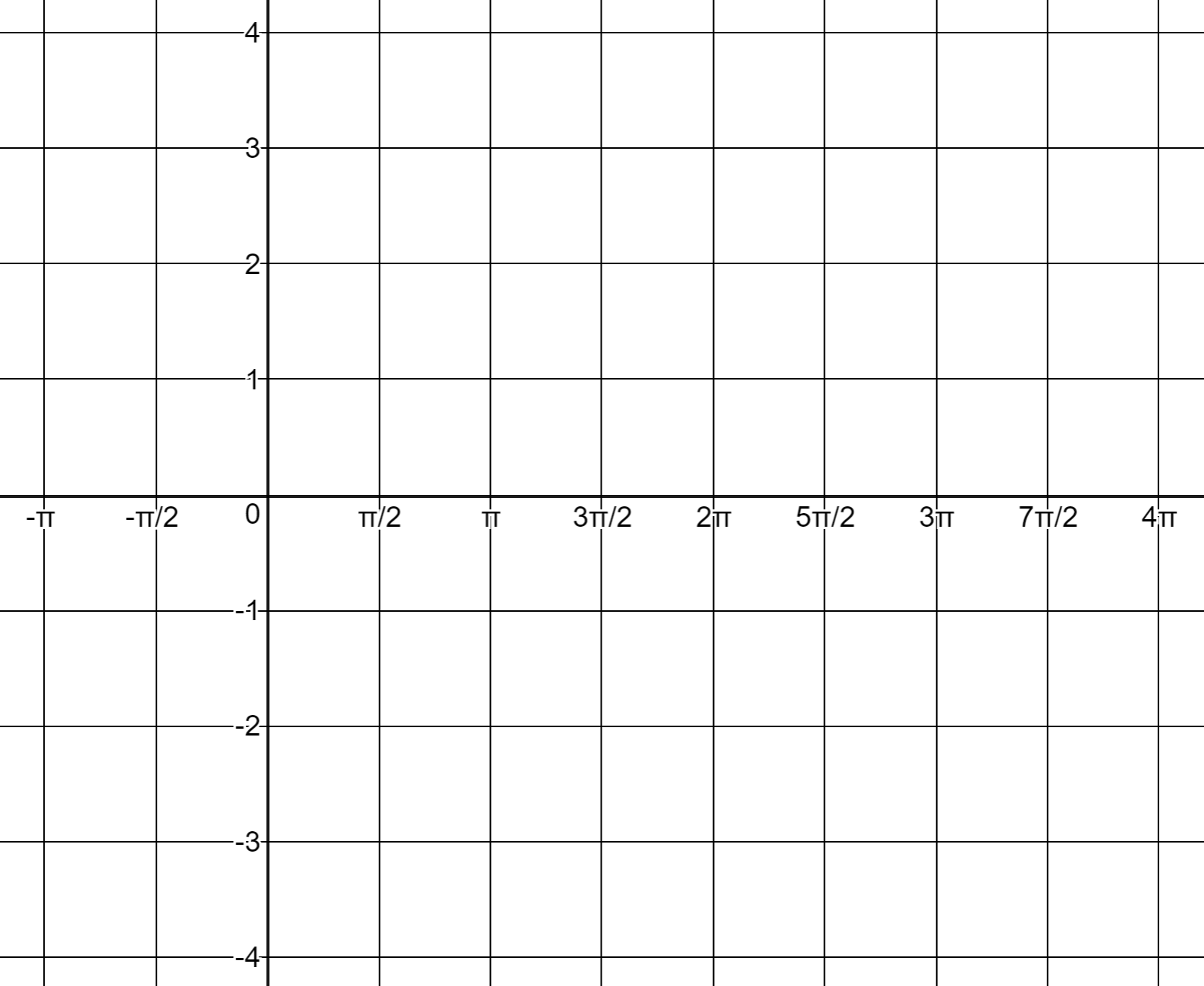
Vertical Stretch

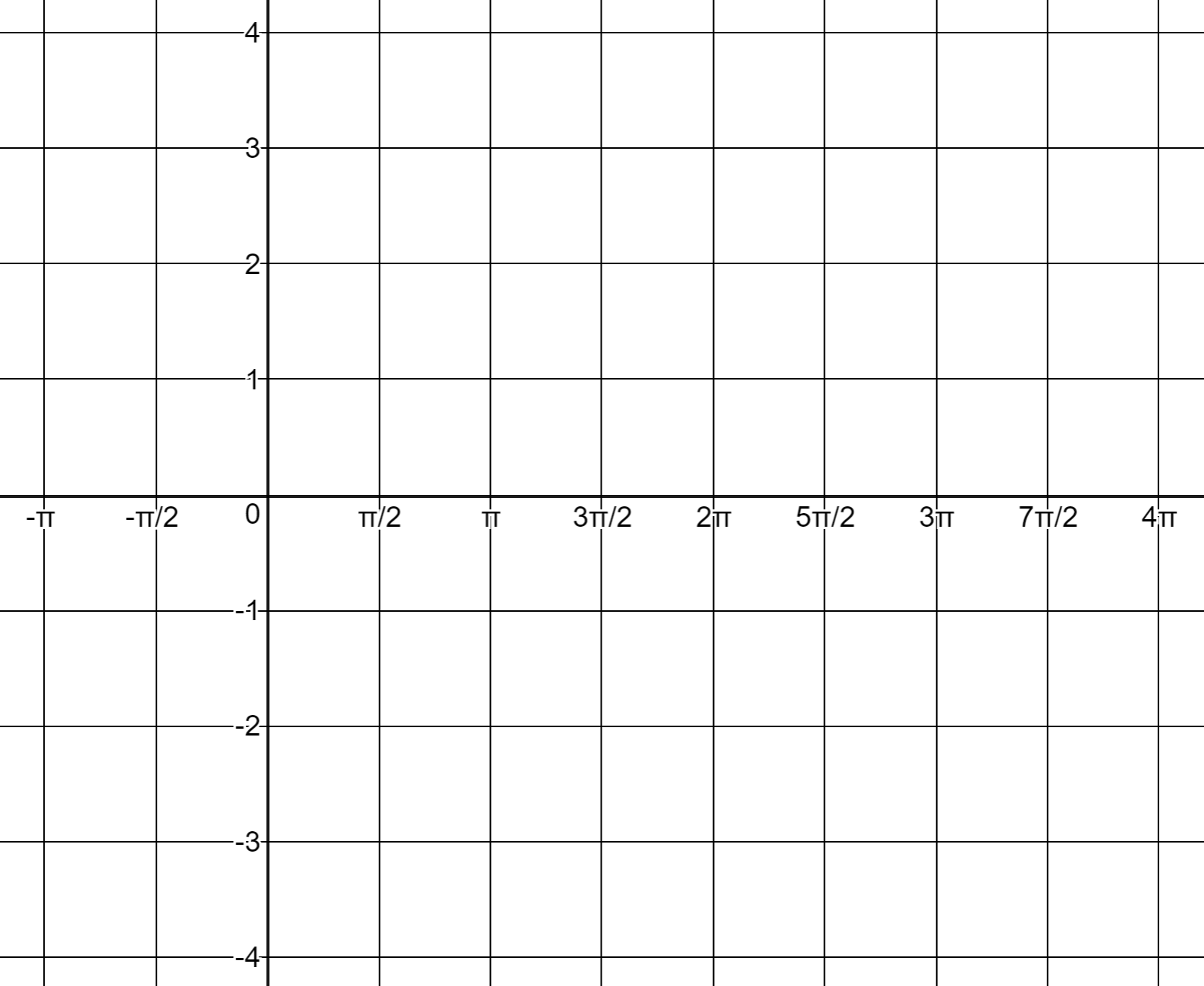
d

Assume a

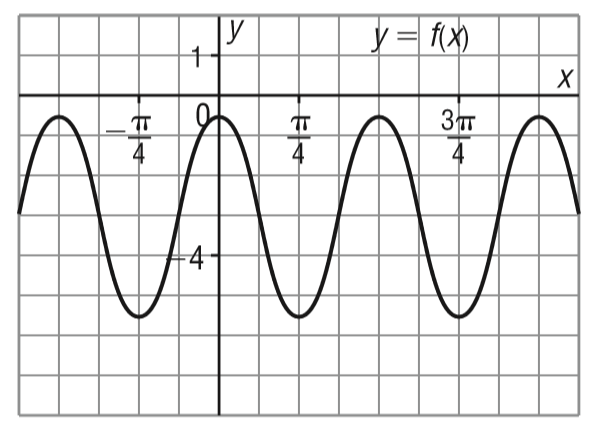
**Vertical displacement**: The vertical shift of the graph of a periodic function.

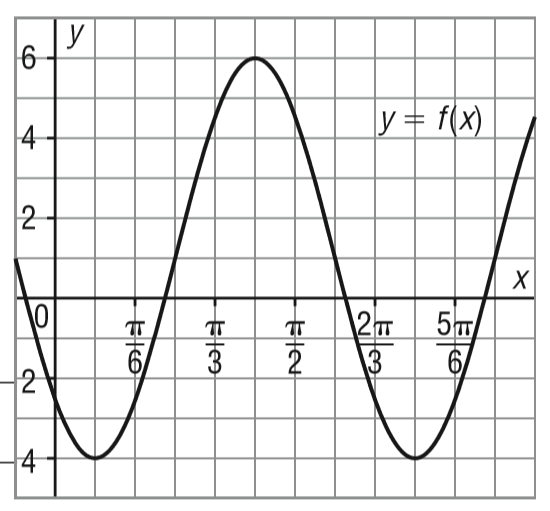
**Phase shift**: The horizontal shift of the graph of a periodic function.

Ex: 1 Identify the amplitude, period, horizontal shift, and midline for the function. Then graph it.

  
Ex: 2 Identify the amplitude, period, starting position, and midline and then graph.

Ex: 3 Identify the amplitude, period, horizontal shift, and midline and then write an equation in terms of sin(x).



Ex: 4 Identify the amplitude, period, horizontal shift, and midline and then write an equation in terms of sin(x).

DESMOS ACTIVITY: GRAPHING THE SINE FUNCTION

DESMOS MARBLESLIDES

Ex: 5 Sketch the graph of y=sin (θ-45˚) +2 for two cycles then fill in the table below



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Vertical stretch factor | Horizontal stretch factor | Phase shift | Vertical displacement | Midline |
|  |  |  |  |  |

b) Sketch the graph of y = cos (θ + π) -1 for two cycles then fill in the table below



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Vertical stretch factor | Horizontal stretch factor | Phase shift | Vertical displacement | Midline |
|  |  |  |  |  |

Ex: 6 Sketch the graph of the function

Y = 3 sin (2x - ) + 1 over two cycles\*\*\*\*\*\*\*\*\* FACTOR OUT “B”



**Find the following**

Vertical displacement:

Amplitude:

Period:

Phase shift:

Domain:

Range:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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