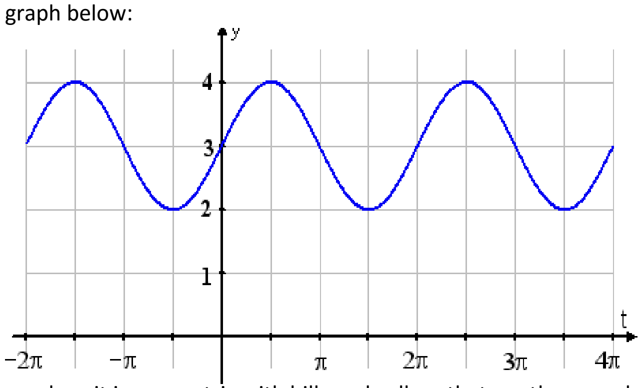
PCFU: Period, Amplitude, & Midline H6-H8 Name: ____

Answers with explanations

1) Identify the period, amplitude, and midline of the graph below:



he graph so it is symmetric with hills and valleys that are the same height above and below. From the midline, the height above and below is one unit. That means **<u>the amplitude is 1</u>**. The period is the length of a whole cycle. If you think about the cycle starting when x=0, you can see that the graph will go up to the maximum and down to the minimum and back to middle at 2π. This means that **<u>the period is 2π</u>**.

2) Identify the period, amplitude, and midline of the function $y = \cos\left(\frac{1}{4}x\right) - 2$.

When I look at the equation, the first thing I noticed was the 2 that was subtracted at the end. I know that is a vertical shift down two units. This means that the midline has moved from y = 0. **<u>The midline is at y = -2</u>**. When I am given an equation, I can tell if the amplitude is something other than 1 by looking at the front of the function. If the function is multiplied by a constant then the amplitude will change. In this case the amplitude is unchanged. **<u>The amplitude is 1.</u>** That leaves me with the $\frac{1}{4}$ that multiplies with the x-value. The coefficient on the x-value of the function affects the period of the function. That number makes the graph looks skinnier or fatter or makes the cycles go more rapidly or more slowly. To find the effect the coefficient has on the period, you divide 2π by $\frac{1}{4}$. **<u>The period for this function would be 8π.</u>**

3) Write an equation of a sine function with a period of $\frac{\pi}{2}$, amplitude of 6 and midline at 3.

$$\boldsymbol{y = 6\sin(4x) + 3}$$

The amplitude is determined by the constant number multiplied in the front of the function. This affects the vertical stretch of the function. The midline is determined by the constant added or subtracted at the end of the function. This is the vertical shift. The period is determined by the coefficient on the x-value in the function. To figure out what to put there I divided 2π by the period.

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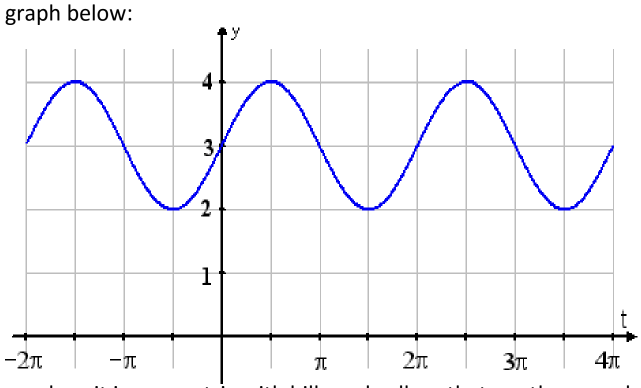

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2) Identify the period, amplitude, and midline of the function $y = \cos\left(\frac{1}{4}x\right) - 2$.

When I look at the equation, the first thing I noticed was the 2 that was subtracted at the end. I know that is a vertical shift down two units. This means that the midline has moved from y = 0. **<u>The midline is at y = -2</u>**. When I am given an equation, I can tell if the amplitude is something other than 1 by looking at the front of the function. If the function is multiplied by a constant then the amplitude will change. In this case the amplitude is unchanged. **<u>The amplitude is 1.</u>** That leaves me with the $\frac{1}{4}$ that multiplies with the x-value. The coefficient on the x-value of the function affects the period of the function. That number makes the graph looks skinnier or fatter or makes the cycles go more rapidly or more slowly. To find the effect the coefficient has on the period, you divide 2π by $\frac{1}{4}$. **<u>The period for this function would be 8π.</u>**

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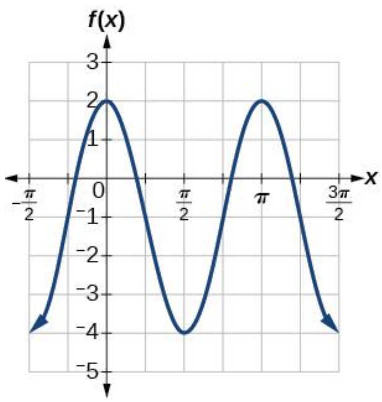
Additional Practice:



1) Draw in the midline on the graph so that the graph is balanced above and below. Name the midline. Y =

2) Now determine how far above and below the midline the graph rises and falls. This is the amplitude. What is the amplitude of this function?

3) The period is the interval for a complete cycle to complete. Look at where the height of the graph is when x = 0. Now find the next time the graph is at the same height. This is the period – how long it takes to make a complete cycle. What is the period for this graph?

4) Find the midline, period and amplitude for this function: $f(x) = 4\sin(x) + 1$.

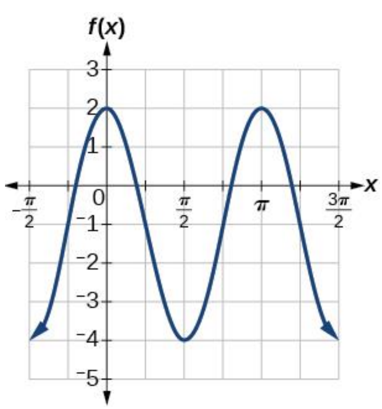
a) Midline:

b) Period:

c) Amplitude:

5) Write an equation for a cosine function with an amplitude of 2, a period of 3π and a midline at -4.

Additional Practice:



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d) Midline:

e) Period:

f) Amplitude:

5) Write an equation for a cosine function with an amplitude of 2, a period of 3π and a midline at -4.