

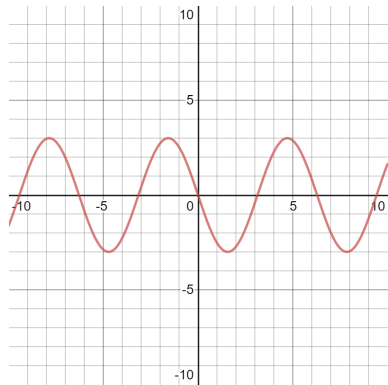
# Ch.6

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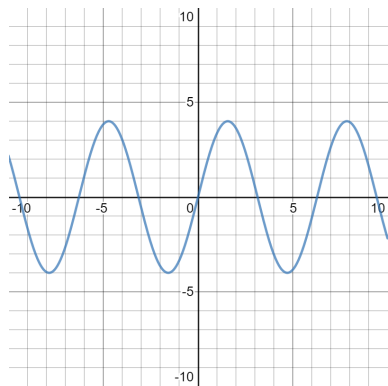
## 1 6.1

1.  $f(x) = -3\sin(x)$



This problem was very easy and gave me no issues. I just had to plug the equation into desmos to find my answer. It was very quick.

2.  $f(x) = 4\sin(x)$



I also just had to plug the equation into desmos to get my answer. This was very quick and easy.

11.  $y=3\sin(8(x+4))+5$  Find the period, amplitude, horizontal shift, and midline

period:  
 $(8x+32)$   
 $2\pi/|b|$   
 $2\pi/8$  divide top and bottom by 2  
 $\pi/4$   
horizontal shift:  
 $c/b$   
 $-32/8$   
 $-4$

amplitude= 3 period= $\pi/4$  horizontal shift=4 to the left midline=5

This question was a bit confusing at first. I am not completely sure that I did it right because it is kind of starting to make sense but I tried.

13.  $y=2\sin(3x-21)+4$  Find the period, amplitude, horizontal shift, and midline

period: $(3x-21)$   
 $2\pi/|b|$   
 $2\pi/3$   
horizontal shift:  
 $c/b$   
 $21/3$   
7 to the right

amplitude= 2 period= $2\pi/3$  horizontal shift=7 to the right midline=4

This question was a bit easier because I got through the first question. I got a bit confused about calculating the horizontal shift but I figured it out.

For the 2 for 21-24 I did not understand it at all so I couldn't do them. I tried but in this case it is impossible for me.

## 2 6.2

5.  $f(x)=2\tan(4x-32)$  find period and horizontal shift

period:  $(4x-32)$   
 $2\pi/|b|$   
 $2\pi/4$  Divide top and bottom by 2  
 $\pi/2$

horizontal shift:  
 $c/b$   
 $32/4$   
 8

period= $\pi/2$  horizontal shift=8 to the right

I really hope that I did this right but I am not really sure. I don't know how to get the answer. I will familiarize myself with this at a later.

6.  $g(x)=3\tan(6x+42)$

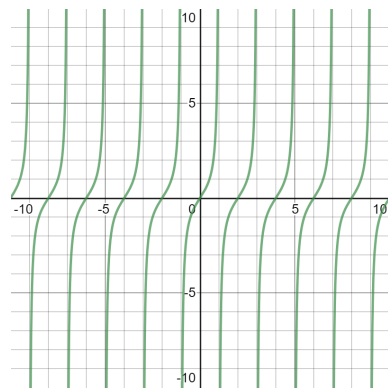
period: $(6x+42)$   
 $2\pi/|b|$   
 $2\pi/6$   
 $\pi/3$

horizontal shift:  
 $c/b$   
 $-42/6$   
 -7

Period= $\pi/3$  horizontal shift= 7 to the left

I think I completely understand the horizontal shift. I have had a couple issues with the period and I think I am almost there.

15.  $j(x) = \tan(\pi/2^*)(x)$



This problem took no effort or thought because I just put it into desmos.

21. If  $\tan(x) = -1.5$  then find  $\tan(-x)$

you flip the sign so  $\tan(-x) = 1.5$

This problem was quick and easy because it was just flipping the sign.

23. If  $\tan(x) = 3$  then find  $\tan(-x)$

$\tan(-x) = -3$

This was also really easy because it was just multiplying through the negative sign.

$$\begin{aligned} & 27. \cot(-x)\cos(-x) + \sin(-x) \\ & (-\cot x)(\cos x) - \sin x \\ & (-\cos x/\sin x)(\cos x) - \sin x \\ & -(cos^2 x)/(sin x) - sin x \\ & (-(cos^2 x + sin^2 x))/sin x \\ & -1/\sin x \\ & -\csc x \end{aligned}$$

This one gave me a lot of trouble and I had to use the solution manual to help. I will watch videos on this to help me learn.

### 3 6.3

1.  $\sin^{-1}(\sqrt{2}/2)$

$$\begin{aligned} \sin^{-1} &= [-\pi/2, \pi/2] \\ \sin^{-1}(\sqrt{2}/2) &= \pi/4 \end{aligned}$$

This one was a bit confusing. I still don't completely understand sine but I will study and ask my dad who is really good at this.

5.  $\cos^{-1}(1/2)$

$$\begin{aligned} \cos^{-1} &= [0, \pi] \\ \cos^{-1}(1/2) &= \pi/3 \end{aligned}$$

This problem was a bit confusing and I don't know if I would be able to do this out on paper. I am not confident.

$$19. \sin^{-1}[\cos(\pi/4)]$$

$$\sin^{-1}(\sqrt{2}/2)$$

$$\pi/4$$

Parts of this problem were easier because of other problems but I don't think I fully grasp the subject.

$$21. \sin^{-1}[\cos(4\pi/3)]$$

$$\sin^{-1}(-1/2)$$

$$4\pi/3$$

I am getting this concept because I am using the patterns to put the pieces together.

## 4 6.4

$$1. 2\sin(\theta) = -\sqrt{2}$$

$$\begin{aligned} \sin(\theta) &= -\sqrt{2}/2 \\ \theta &= 5\pi/4 + 2k\pi \\ \theta &= 7\pi/4 + 2k\pi \\ \text{Since } 0 \leq \theta < 2\pi &= 5\pi/4 \text{ and } 7\pi/4 \end{aligned}$$

This question was very confusing and I had to use the solution manual.

$$3. \sin(\theta) = 1$$

$$(0 \leq \theta < 2\pi)$$

$$\begin{aligned} \theta &= \pi/2 + 2k\pi \\ \theta &= \pi/2 \end{aligned}$$

I had a few issues with set up but I think I am understanding what is happening here. I will find an explanation for it just to make sure.

$$9. 2\cos(\theta) = \sqrt{2}$$

$$\begin{aligned} \cos(\theta) &= \sqrt{2}/2 \\ \theta &= \pi/4 + 2k\pi, 7\pi/4 + 2k\pi \end{aligned}$$

The first steps were easy and then I got lost. I had to use the solution manual and will have to look into it more.

$$11. 2\sin(\theta) = -1$$

$$\begin{aligned}\sin(\theta) &= -1/2 \\ \theta &= 7\pi/6 + 2k\pi, 11\pi/6 + 2k\pi\end{aligned}$$

This was kind of easier because I am coming to understand a bit better.

$$13. 2\sin(3\theta) = 1$$

$$\begin{aligned}\sin(3\theta) &= 1/2 \\ 3\theta &= \pi/6 + 2k\pi, 5\pi/6 + 2k\pi \\ \theta &= \pi/18 + 2k\pi/3, 5\pi/18 + 2k\pi/3\end{aligned}$$

This problem was confusing. It was hard to follow and I had to look at the solution manual.

$$17. 2\cos(2\theta) = 1$$

$$\begin{aligned}\cos(2\theta) &= 1/2 \\ 2\theta &= \pi/3 + 2k\pi, 5\pi/3 + 2k\pi \\ \theta &= \pi/6 + k\pi, 5\pi/6 + k\pi\end{aligned}$$

This problem was not easy to do. I did not understand and will be working toward understanding it.

$$33. 7\sin(6x) = 2 \text{ finding the first two positive solutions}$$

$$\begin{aligned}\sin(6x) &= 2/7 \\ 6x &= \sin^{-1}(2/7) \\ 6x &= .28975 + 2k\pi, 6x = \pi - .28975 + 2k\pi \\ 6x &= .28975 \text{ or } 6x = \pi - .28975 = 2.85184\end{aligned}$$

$$x = 0.04829 \text{ or } 0.47531$$

This problem was a bit confusing. I was following for about half of it. I don't really know where the numbers with the decimal points came from.

$$35. 5\cos(3x) = -3 \text{ finding the first two positive solutions}$$

$$\begin{aligned}\cos(3x) &= -3/5 \\ 3x &= \cos^{-1}(-3/5) \\ 3x &= 2.2143 + 2k\pi, \text{ or } 3x = 2\pi - 2.2143 + 2k\pi \\ 3x &= 2.2143 \text{ or } 3x = 2\pi - 2.2143 = 4.0689\end{aligned}$$

$$x = 0.7381 \text{ or } 1.3563$$

I am getting the hang of the process. I am only confused about where one of the numbers comes from now. I will make sure I completely understand.

## 5 6.5

7. find  $d(t)$  equation  
given: 63, 37, 5

amplitude:  
 $63 - 37/2$   
 $26/2$   
13

midline:  
 $63 + 37/2$   
 $100/2$   
50

Horizontal shift:  $-5/5$  to the left

horizontal stretch factor:  
 $2\pi/24$   
 $\pi/12$

$$D(t) = -13\cos(\pi/12(t - 5)) + 50$$

This problem was a lot to take in at first but once I broke it down it made a lot more sense. It is a bit challenging and takes a bit to take apart.

9a. find the equation for population since January = lowest

given: average = 129 deviation = 25 Jan(t=0)