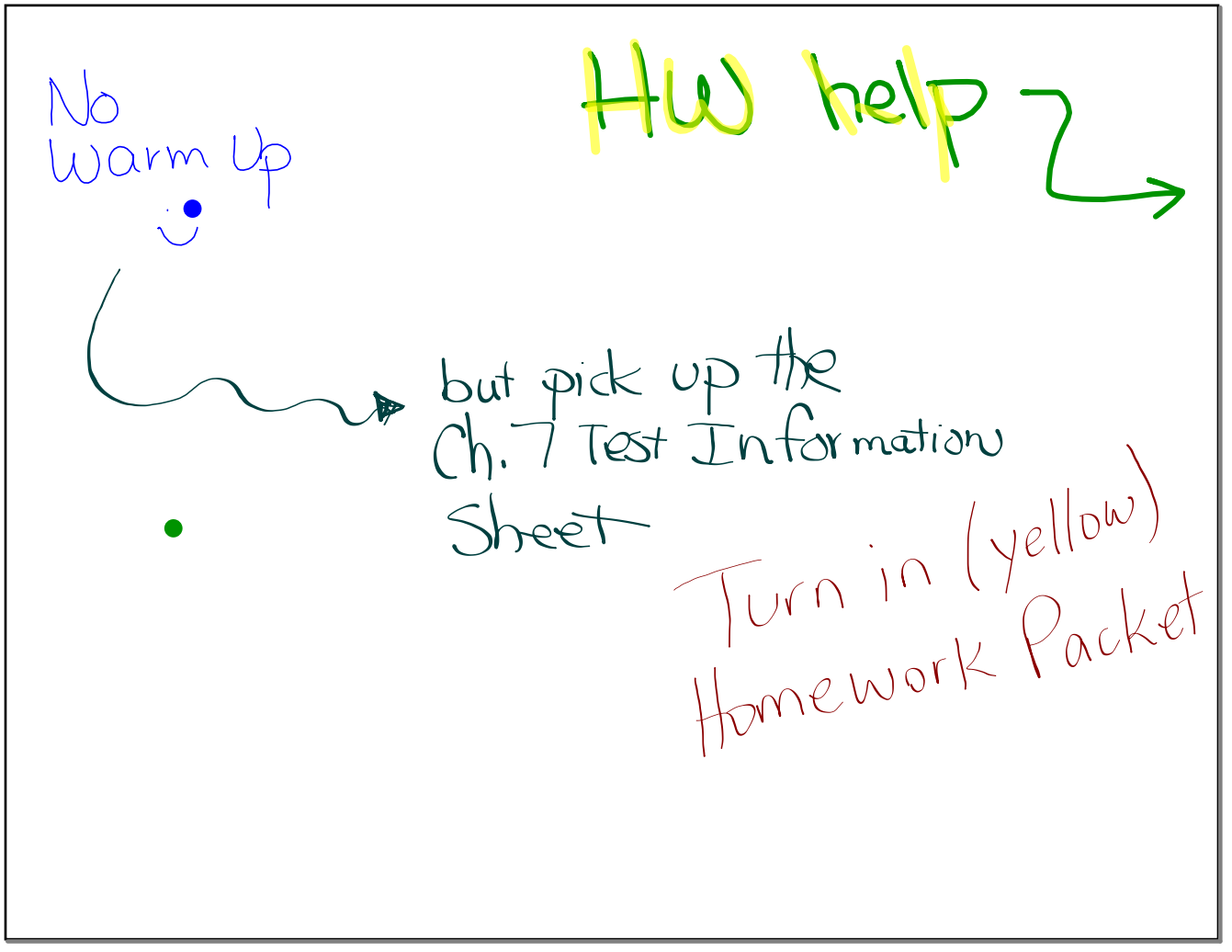
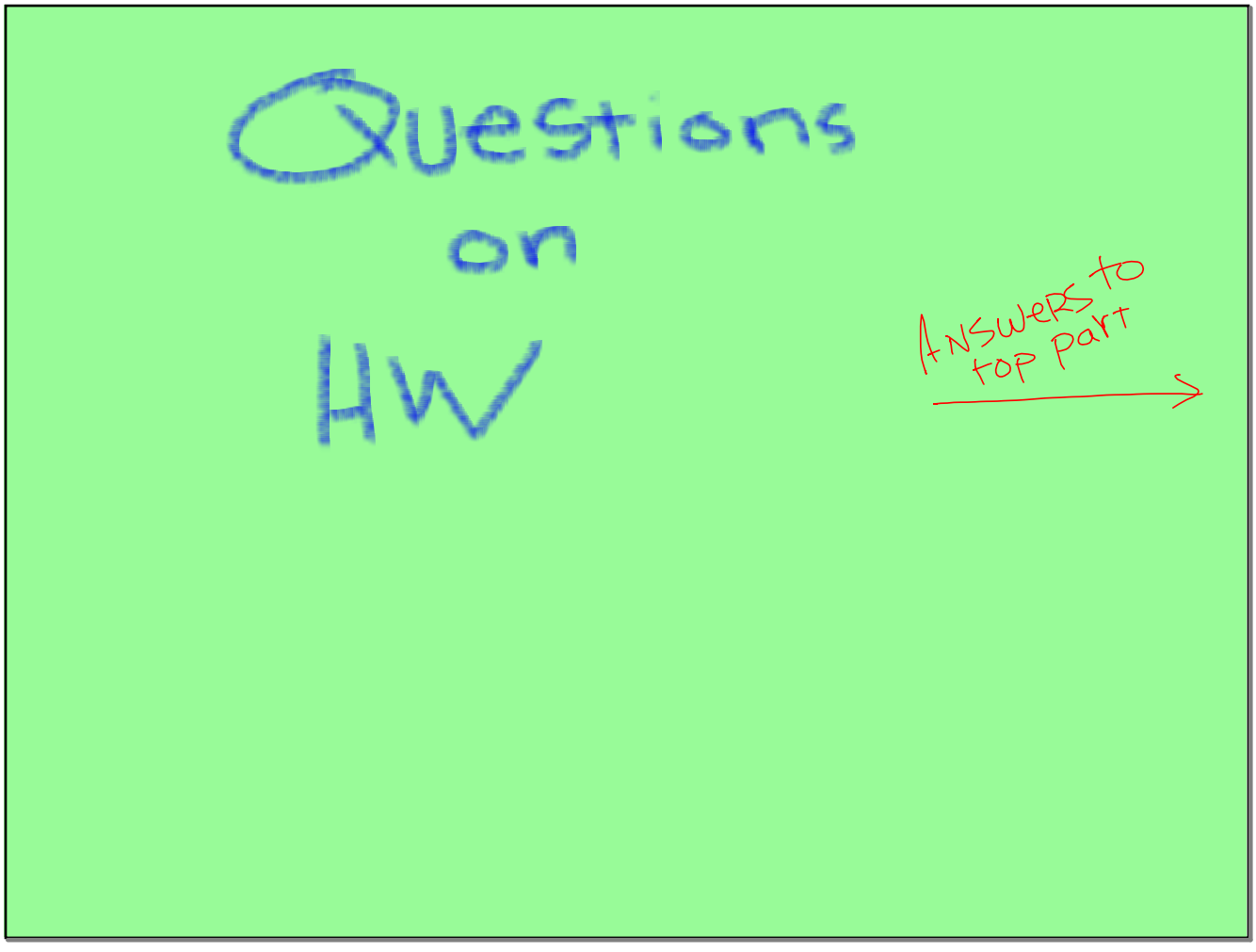
May 17, 2019


No
Warm Up
HW help
but pick up the
Ch. 7 Test Information
Sheet
Turn in (yellow)
Homework Packet

May 17, 2019



A. Determine the amplitude and period of each function.

a) $y = \sin 4x$

$A = 1$ $\quad Per = \frac{\pi}{2}$

b) $y = \cos 5x$

c) $y = 4 \cos x$

d) $y = -2 \sin x$

e) $y = 3 \sin \frac{2}{3}x$

f) $y = -4 \cos 5x$

A. Determine the amplitude and period of each function.

a) $y = \sin 4x$

$A = 1$ $\quad Per = \frac{\pi}{2}$

2π

$\frac{2\pi}{4} = \frac{\pi}{2}$

b) $y = \cos 5x$

$A = 1$ $\quad Per = \frac{2\pi}{5}$

c) $y = 4\cos x$

$A = 4$ $\quad Per = 2\pi$

d) $y = -2\sin x$

$A = 2$ $\quad Per = 2\pi$

e) $y = 3\sin\frac{2}{3}x$

$A = 3$ $\quad Per = 3\pi$

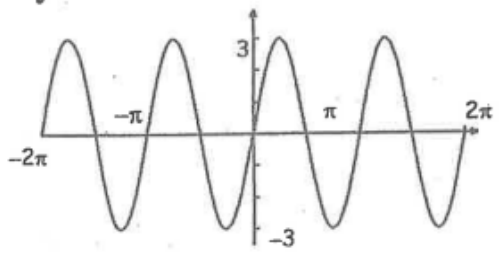
f) $y = -4\cos 5x$

$A = 4$ $\quad Per = \frac{2\pi}{5}$

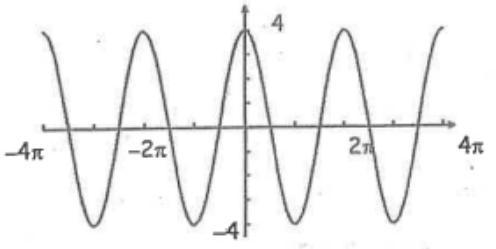
$$\frac{2\pi}{\frac{2}{3}} \longrightarrow \frac{\frac{2\pi}{1}}{\frac{2}{3}} = \frac{2\pi}{1} \cdot \frac{3}{2}$$

$$3\pi$$

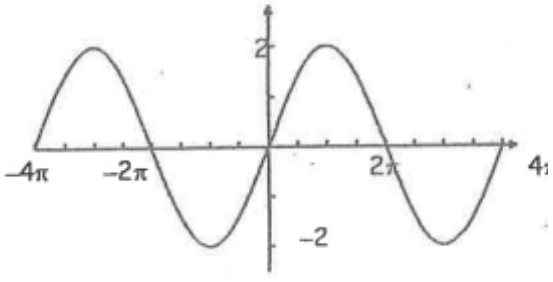
g)



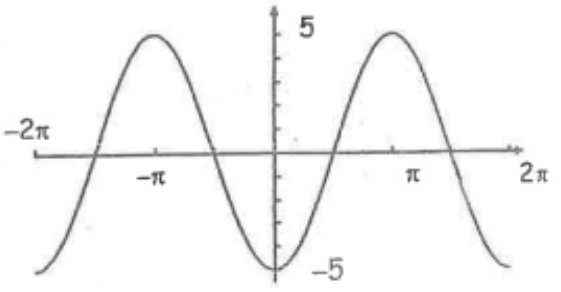
h)



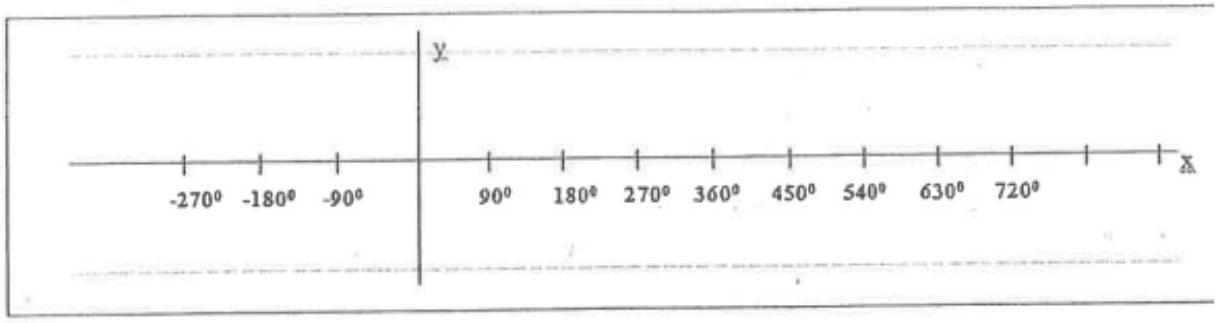
i)



j)

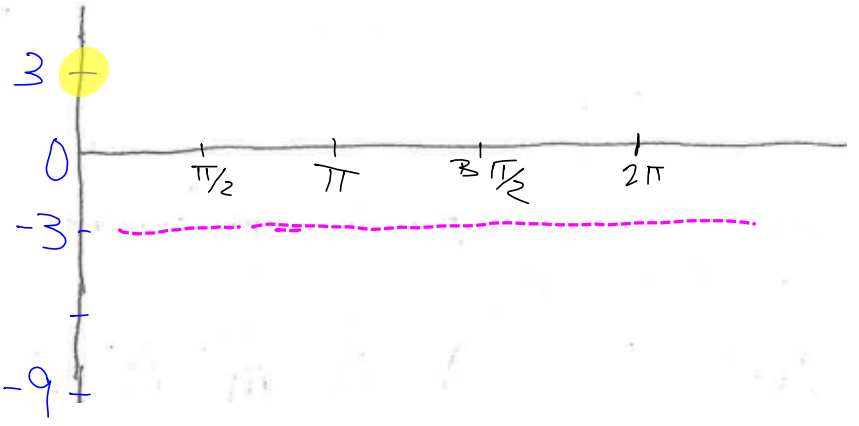


2. Graph $y = 3\sin\left(\frac{1}{2}\theta\right)$



D. Sketch and label 1 cycle of

$y = 6\cos(\theta) - 3$



Part 2 Homework from textbook 7--- 130, 132-133, 134b

- do on separate paper
- staple underneath this sheet

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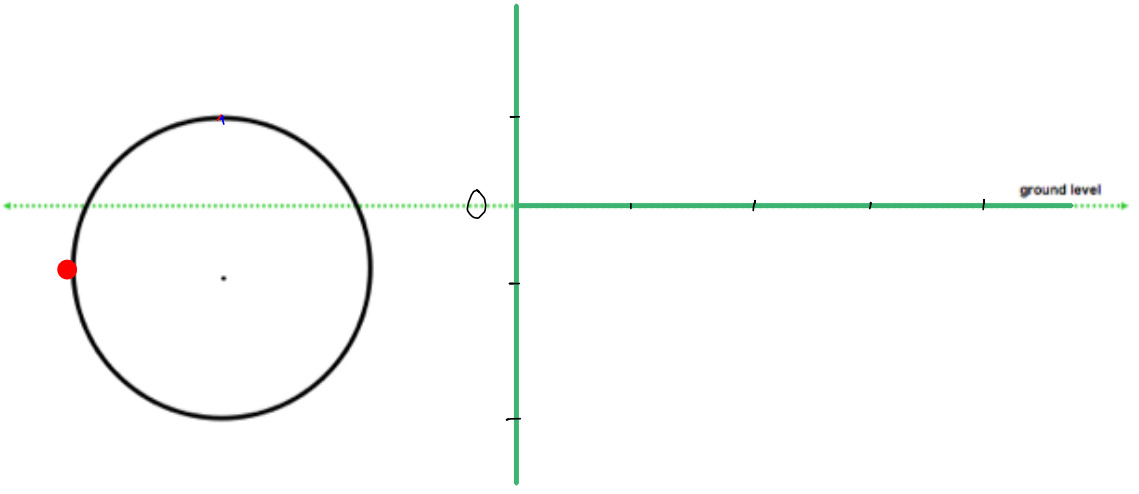
The CPM Amusement Park has decided to imitate *The Screamer* but wants to make it even better. Their ride will consist of a circular track with a radius of 100 feet, and the center of the circle will be 50 feet under ground. Passengers will board at the highest point, so they will begin with a blood-curdling drop. Write a function that relates the angle traveled *from the starting point* to the height of the rider above or below the ground.



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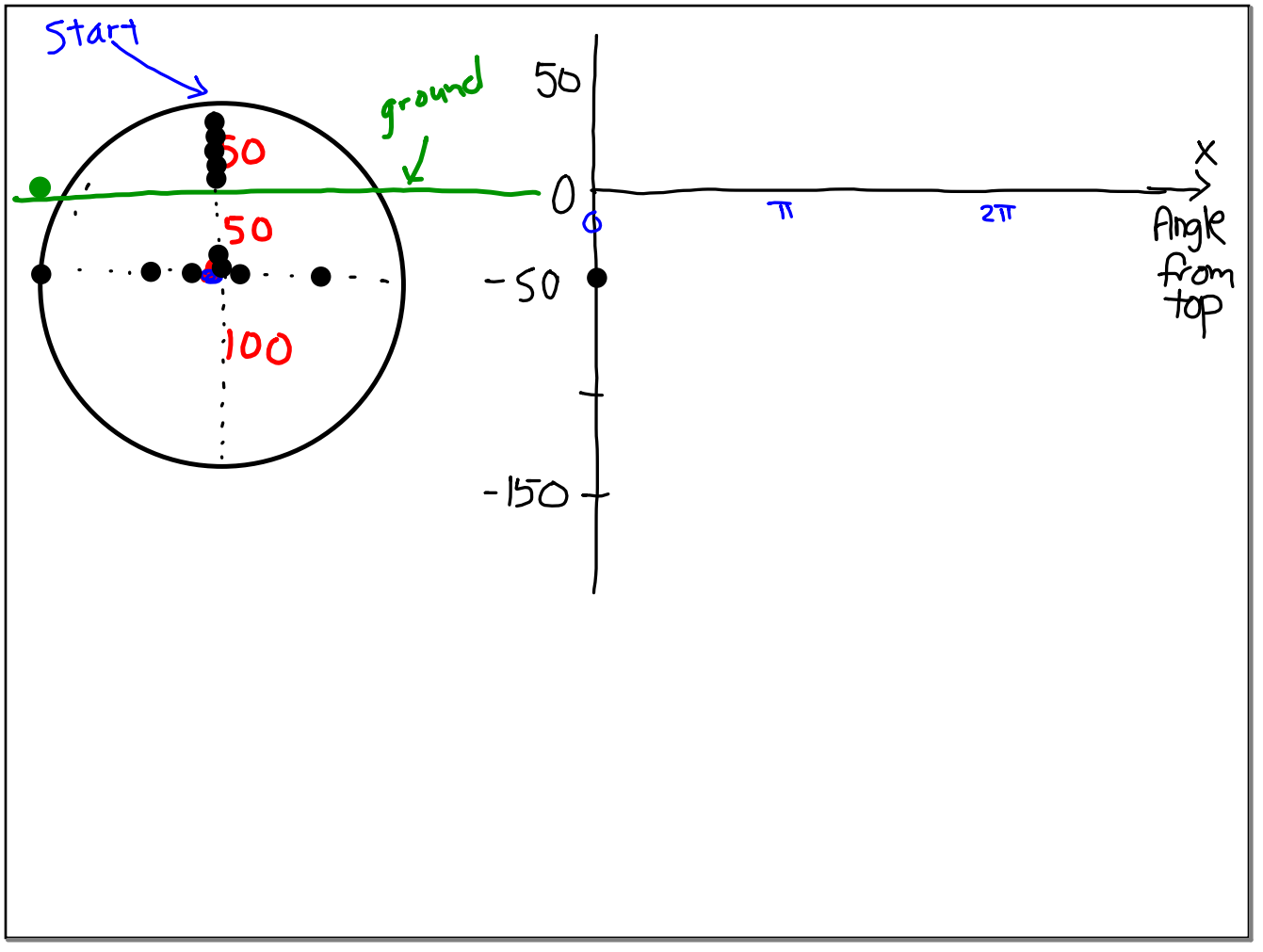

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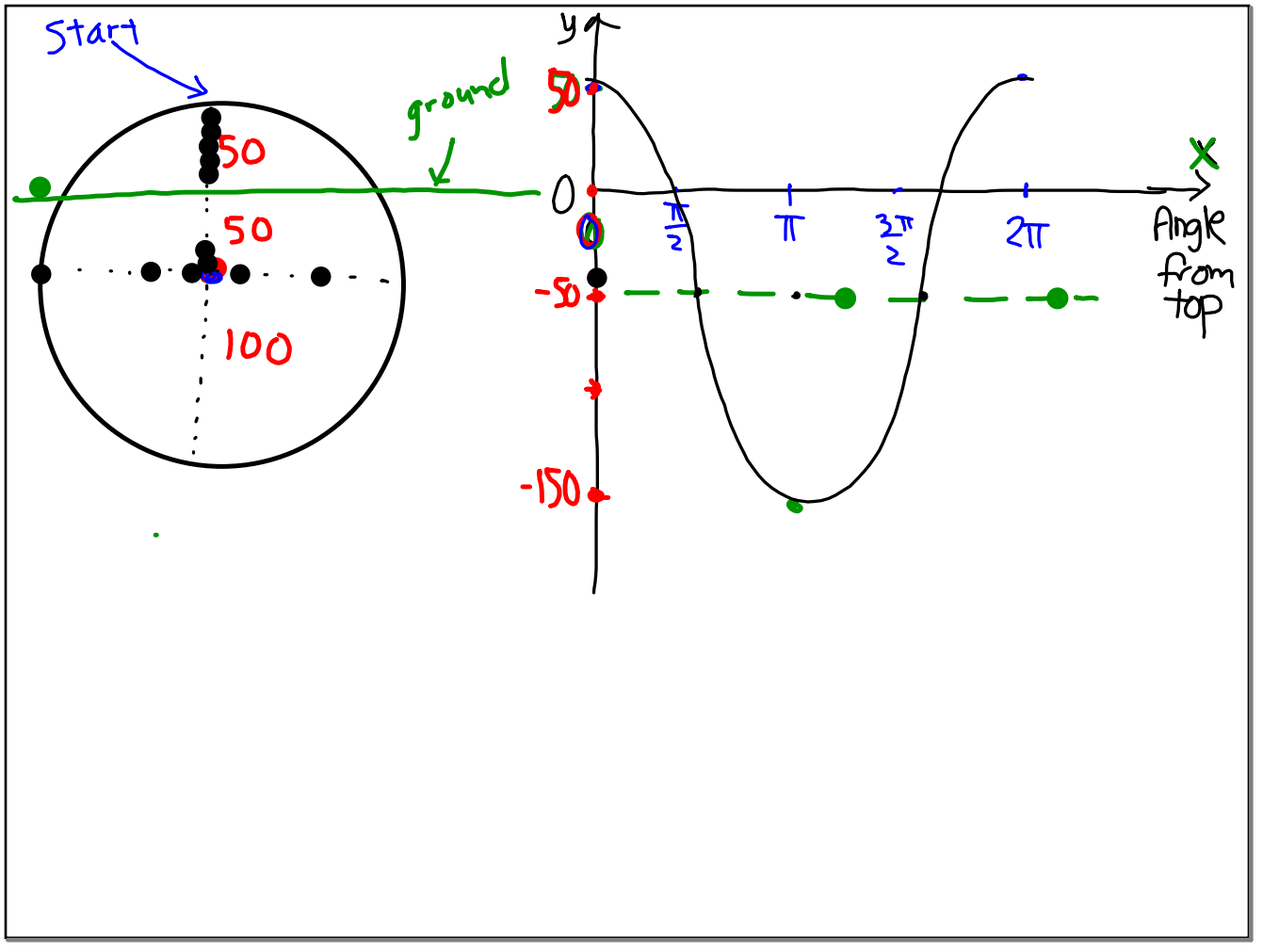
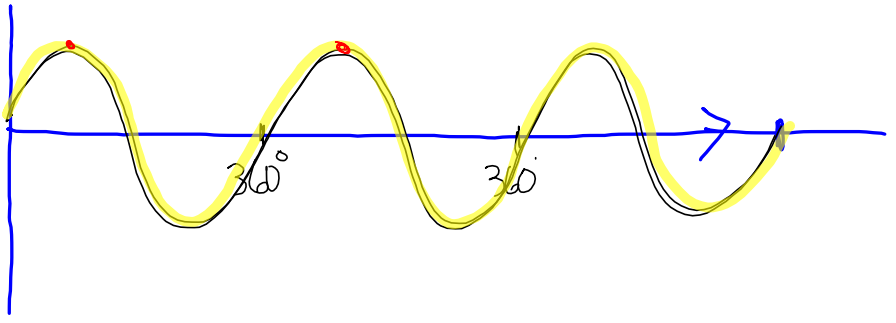

Start
ground
50
50
100
y
50
0
-50
-150
0
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
2π
x
Angle from top

7-130. Claudia graphed $y = \cos\theta$ and $y = \cos(\theta + 360°)$ on the same set of axes. She did not see any difference in their graphs at all. Why not? Homework Help



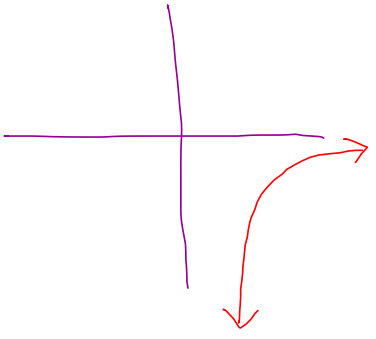
7-132. Find the x- and y-intercepts of the graphs of each of the following equations.

Homework Help

a. $y = 2x^3 - 10x^2 - x$

b. $y + 2 = \log_3(x - 1)$

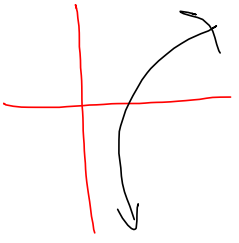
$y = \log_3(x-1) - 2$



y-int

Set $x = 0$

$y + 2 = \log_3(0-1)$



$2 = \log_3 x$

$3^2 = x$

a. $y = 2x^3 - 10x^2 - x$

y-int (0,)

$0 = 2x^3 - 10x^2 - x$

X-int

Set $y = 0$

$$2 = \log_3(x-1)$$

$$3^2 = x - 1$$

$$x = 10$$

7-134. Change each equation to graphing form. For each equation, find the domain and range and determine if it is a function. Homework Help ✎

a. $y = -2x^2 - x + 13$

b. $y = -3x^2 - 6x + 12$

133 COST OF MOVIE $9.50
increasing 4% per year

multiplier: 100% + 4% = 104%
↓
1.04

DOUBLED
COST will be
$19.00

$y = ab^x$

$$19 = 9.50(1.04)^t$$

divide

$$\frac{19}{9.50} = (1.04)^t$$

Today

Today

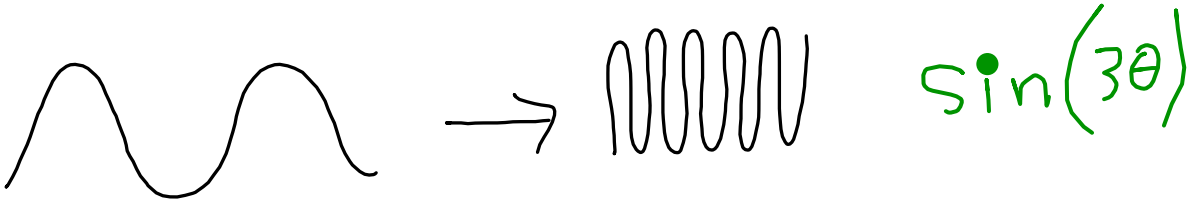
Analyze Transformations of Periodic Functions (using all 4 parameters)

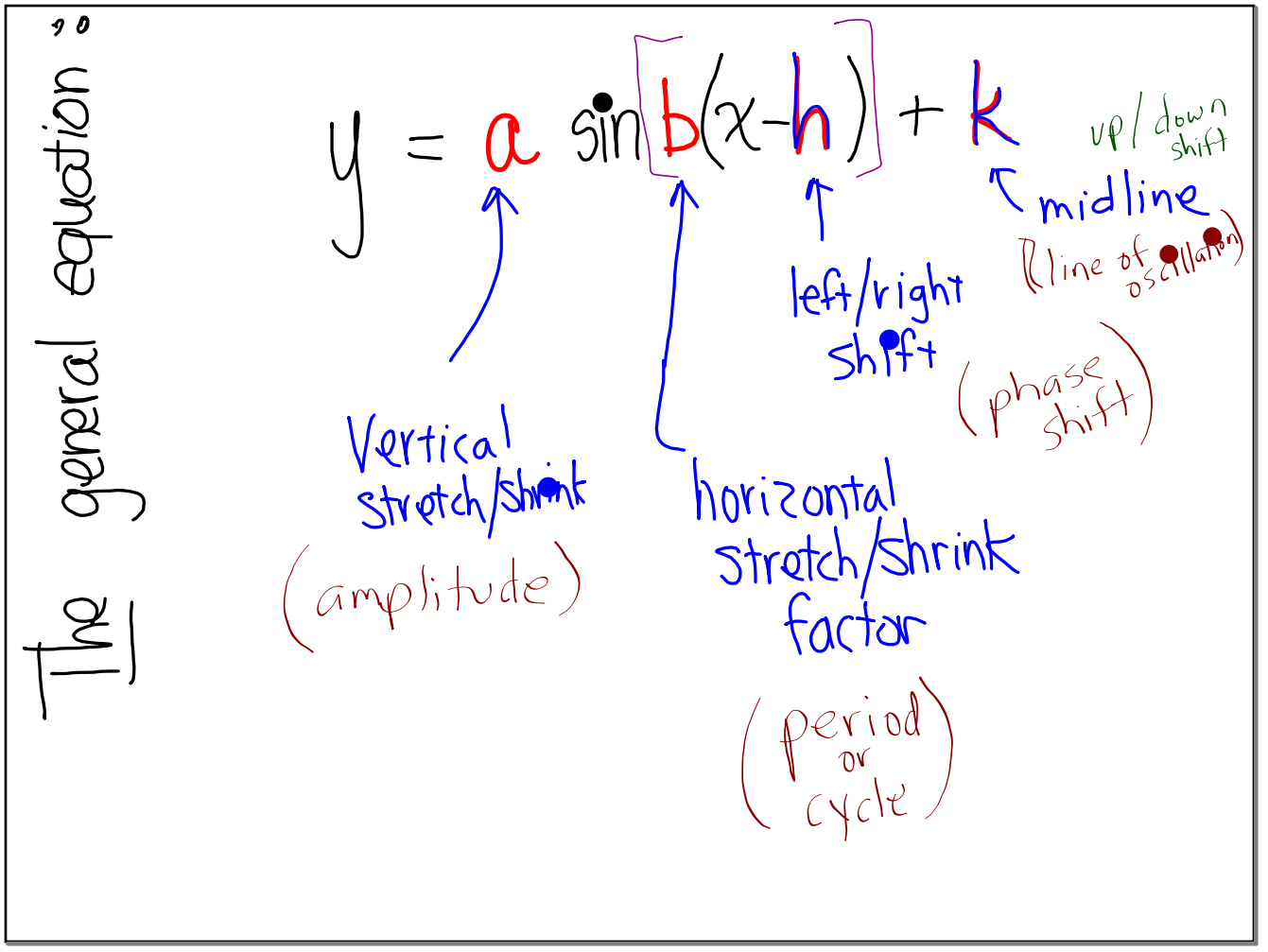
The big idea

In order to model sine (or cosine) waves that occur in real situations, we need to be able to position the wave anywhere in the coordinate plane.

Thus, we have a need to make both scale changes and translations to our waves.

Continuing from yesterday.... $\frac{3\pi}{4}$




The general equation
$y = a \sin[b(x-h)] + k$
Vertical stretch/shrink
(amplitude)
horizontal stretch/shrink factor
(period or cycle)
left/right shift
(phase shift)
midline
(line of oscillation)
up/down shift

What is the relationship between the period of a sine graph and the value of b in its equation?

$$y = \sin(bx)$$

NOTES

What do we know about

$$y = sin(bx)$$??

b tells the number of cycles in 2π

$$\text{Period (length)} = \frac{2\pi}{b}$$

$$b = \frac{2\pi}{\text{Period}}$$

b tells the number of cycles in 2π or 360°

$$\text{Period (length)} = \frac{2\pi}{b}$$

$$b = \frac{2\pi}{\text{Period}}$$

$$\text{Per} = \frac{360^\circ}{b}$$

$$b = \frac{360^\circ}{\text{Period}}$$

A. Determine the amplitude and period of each function.

a) $y = \sin 4x$

$\frac{2\pi}{b}$ $\quad \frac{2\pi}{4} = \frac{\pi}{2}$

b) $y = \cos 5x$

$P = \frac{2\pi}{5}$

c) $y = 4 \cos x$

$P = 2\pi$

d) $y = -2 \sin x$

e) $y = 3 \sin \frac{2}{3}x$

$\frac{2\pi}{\frac{2}{3}} = \frac{2\pi}{1} \cdot \frac{3}{2} = 3\pi$

f) $y = -4 \cos 5x$

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NO Calculator → describe → sketch → check with graphing calculator

M 7.2.4

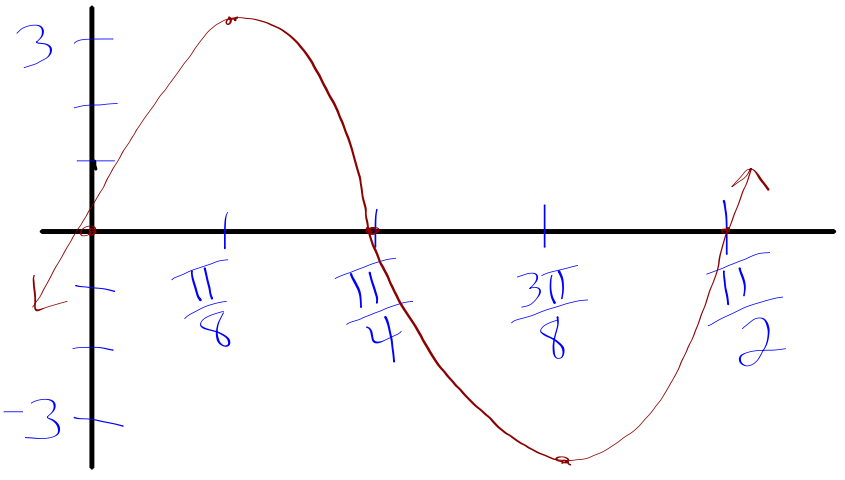
T Closure

W No Calc + Closure

Th. Calculator Test

① $y = 3\sin(4x)$

A = 3
b = 4 Per = $\frac{2\pi}{4} = \frac{\pi}{2}$
h = 0
k = 0



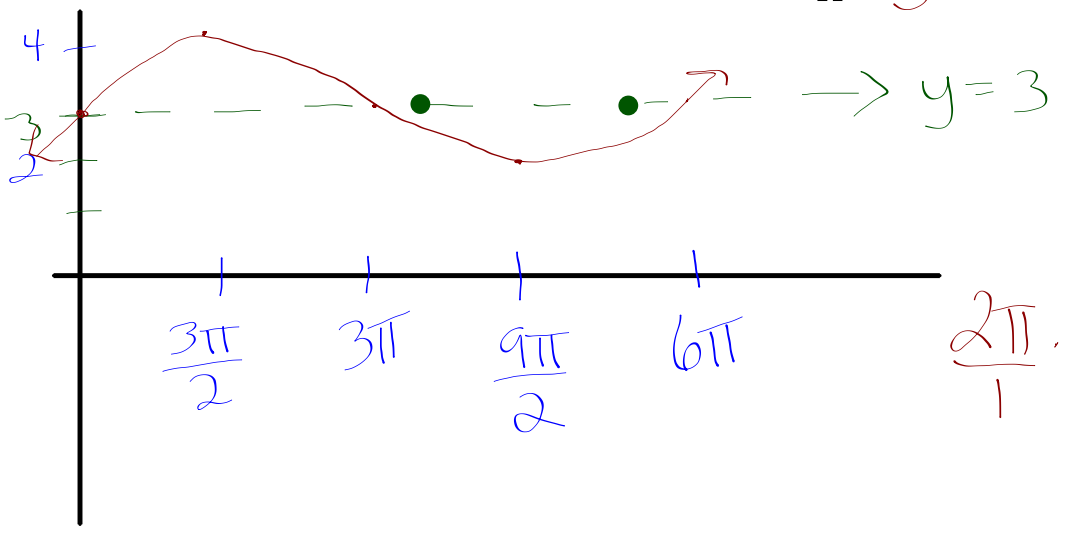
domain ? $-\infty < x < \infty$

range ? $-3 \leq y \leq 3$

(2) $y = 3 + \sin\left(\frac{1}{3}x\right)$

A = 1
b = $\frac{1}{3}$
h = 0
k = 3

Per = $\frac{2\pi}{\frac{1}{3}} = 6\pi$



$\frac{2\pi}{1} \cdot \frac{3}{1} = 6\pi$

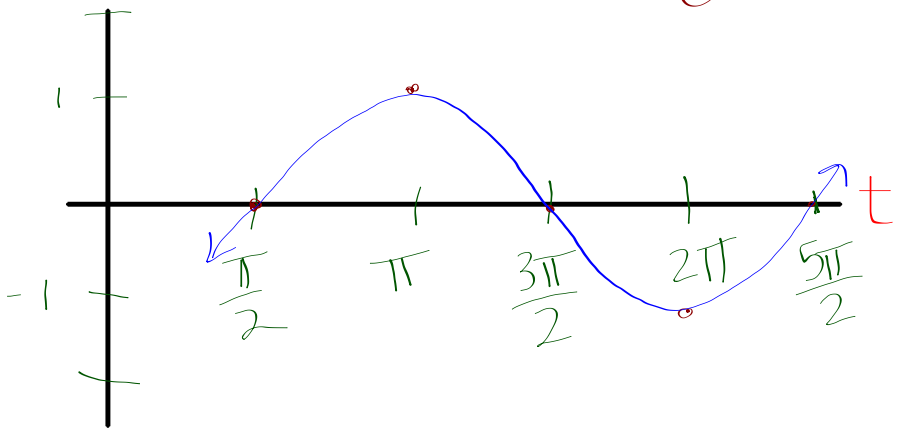
(3) $y = \sin(1t - \frac{\pi}{2})$

A = 1

b = 1 Per = 2π

h = $\frac{\pi}{2}$ Right

k = 0



Check After GDC

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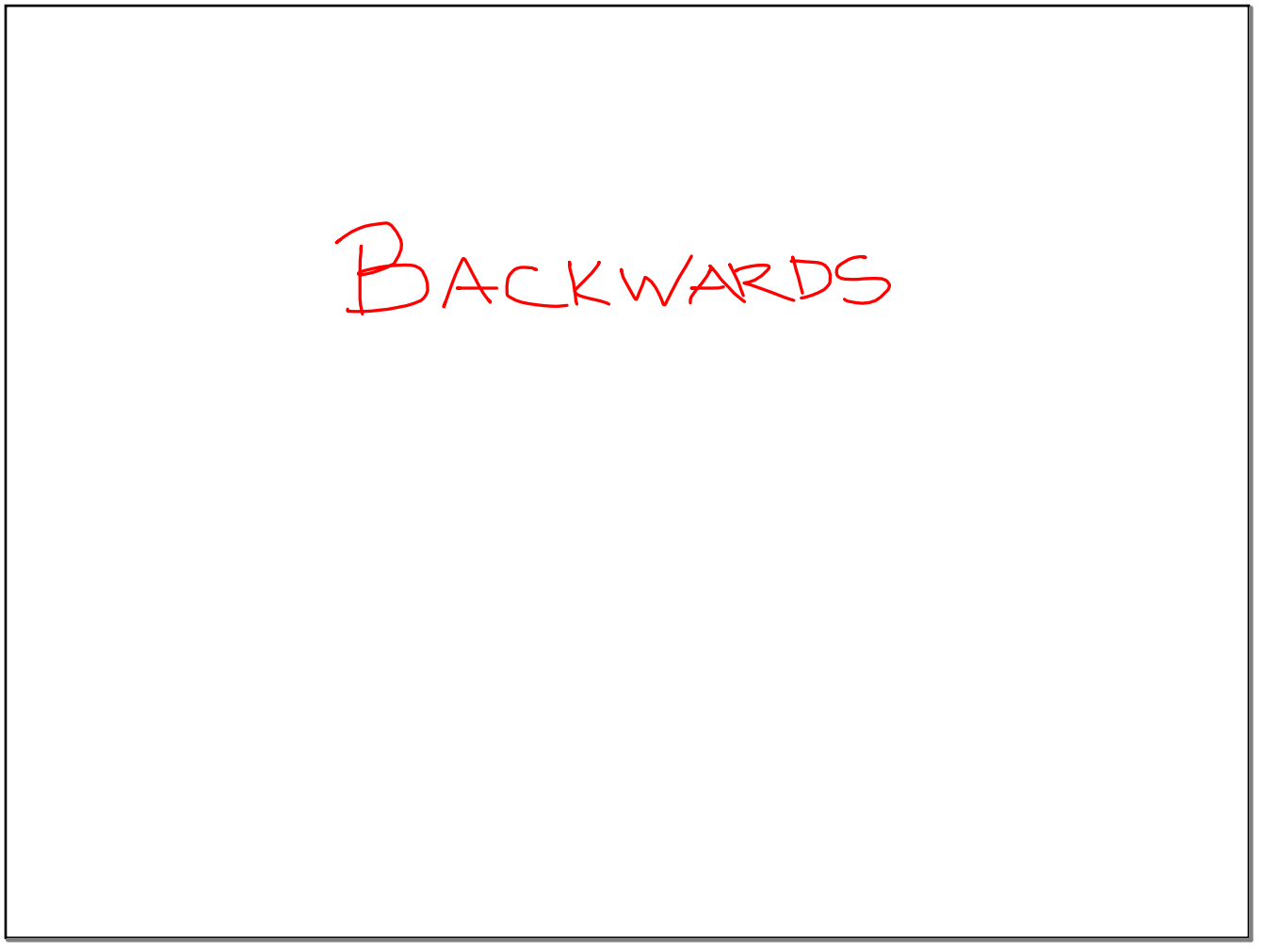
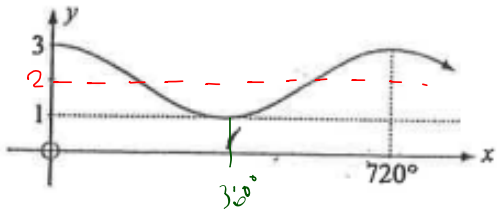


A



cos

A = 1

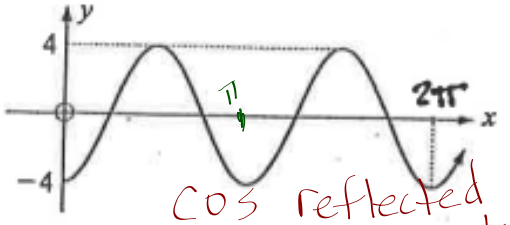
Per = 720° b= $\frac{1}{2}$ $\frac{360°}{720°}$

h = 0

k= 2

$y = \cos\left(\frac{1}{2}x\right)+2$

B



cos reflected

$\frac{2\pi}{\pi}$

A = 4

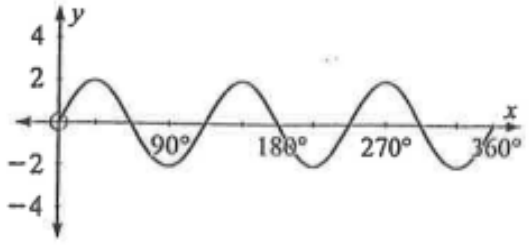
Per = π b = 2

h = 0

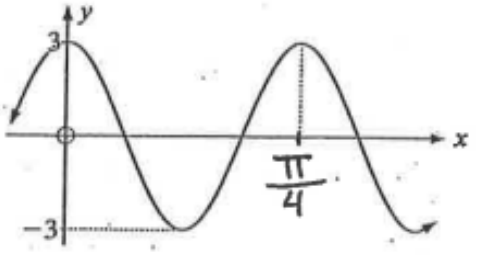
K = 0

$y = -4\cos(2x)$

C



D



A =

Per = b=

h =

k=

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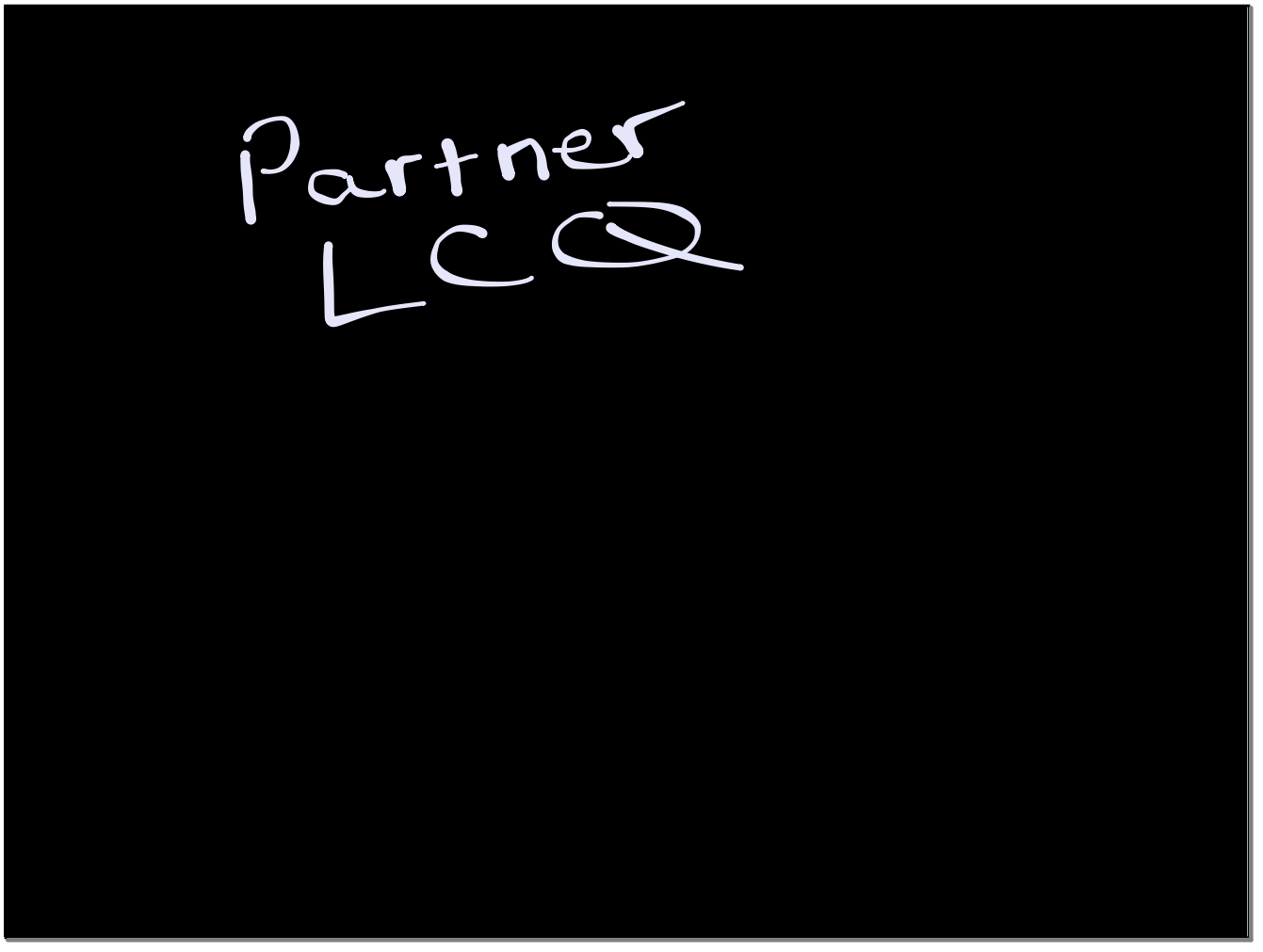

Assignment:

Worksheet : Assignment 7.2.3