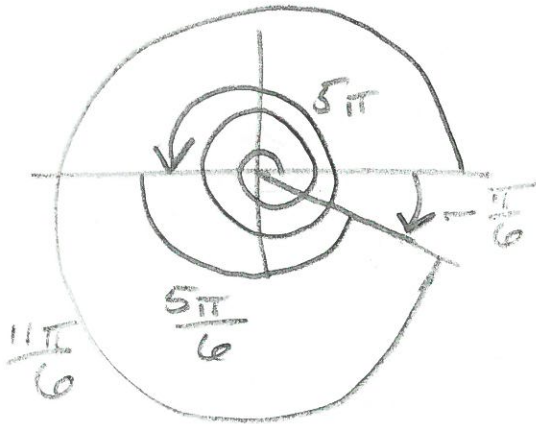


① $\theta = \frac{35\pi}{6} = \frac{30\pi}{6} + \frac{5\pi}{6} = 5\pi + \frac{5\pi}{6}$



$-\frac{\pi}{6} = -30^\circ$
OR
 $\frac{11\pi}{6} = 330^\circ$

10 pts

② a) $s = r\theta = (6)(2344^\circ)(\frac{\pi \text{ rad}}{180^\circ})$

5 pts

IF they use '5'
then
 204.5525883×2
 204.553

$= \frac{1172}{15} \pi \text{ cm} \approx 245.463 \text{ cm}$

b) $A = \frac{1}{2} r^2 \theta = \frac{1}{2} (6)^2 (\frac{2\pi}{3})$
 $= \frac{1}{2} (36) (\frac{2\pi}{3}) = 12\pi \text{ cm}^2$

5 pts

37.69911184

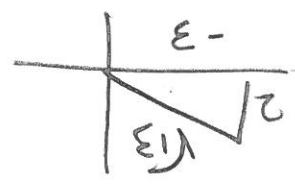
③ $\tan \theta = -\frac{2}{3}$



5 pts

④

(3) (b)



$$(-\frac{2}{2})^2 + (\frac{3}{2})^2 = 4 + 9 = 13$$

5PTS

$$\sin \theta = \frac{2}{\sqrt{13}}$$

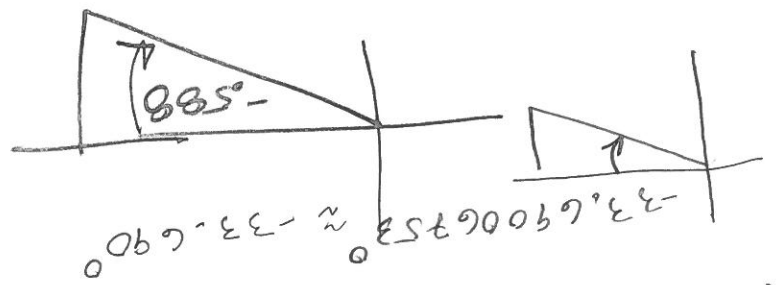
$$\cos \theta = -\frac{3}{\sqrt{13}}$$

$$\cos \theta = \frac{\sqrt{13}}{2}$$

$$\sin \theta = -\frac{\sqrt{3}}{3}$$

$$\cot \theta = -\frac{2}{3}$$

(c) arc tan $(-\frac{2}{3}) \approx -.5880026036$ rad



$$\pi - .5880026036 \approx 2.553590050$$

$\theta \approx 2.554 \text{ rad}$

$$\theta \approx \left(\frac{2.553590050}{\frac{\pi}{180}} \right) \approx 146.3099324^\circ$$

$\theta \approx 146.310^\circ$

(d)

$$- .588 + 2n\pi, n \in \mathbb{Z}$$

$$2.554 + 2n\pi, n \in \mathbb{Z}$$

$$146.310^\circ + 360n, n \in \mathbb{Z}$$

or

$$-33.690 + 360n, n \in \mathbb{Z}$$

$$146.310^\circ + 180n, n \in \mathbb{Z}$$

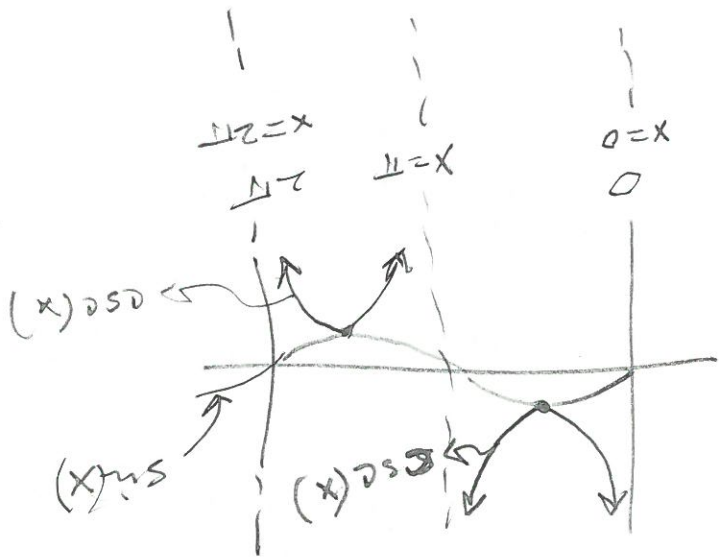
Also legit:

$$- .588 + n\pi, n \in \mathbb{Z}$$

5PTS

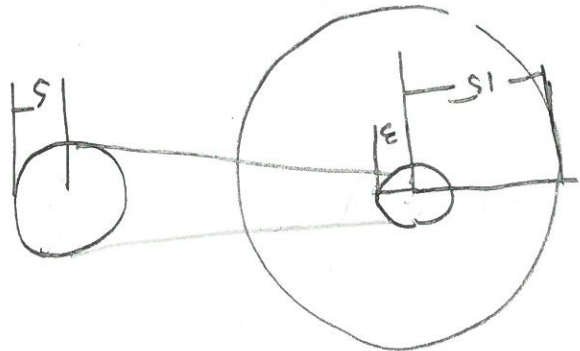
5PTS

(4)



(CPB)

(5)



$$\left(\frac{1.4 \text{ rev on front}}{5 \text{ rev on back}} \right) \left(\frac{3 \text{ rev on front}}{5 \text{ rev on back}} \right) = \left(\frac{14}{10} \right) \left(\frac{3}{5} \right) = \left(\frac{42}{50} \right) \left(\frac{\text{rev back}}{1500} \right)$$

$$= \frac{3}{7} \text{ rev back}$$

$$\left(\frac{1 \text{ ft}}{12 \text{ in.}} \right) \left(\frac{35 \pi \text{ ft}}{6 \text{ sec}} \right) = \frac{35 \pi}{72} \text{ ft/sec}$$

$$\frac{18.32595415}{6} \approx \frac{18.3}{6} = 3.05 \text{ ft/sec}$$

$$\left(\frac{5280 \text{ ft}}{1 \text{ mi}} \right) \left(\frac{1 \text{ hr}}{3600 \text{ sec}} \right) \approx 12.49494078 \frac{\text{mi}}{\text{hr}}$$

5) Method 2 - Analyzing step-by-step

1) convert rev/sec to linear speed of front sprocket.

$$s = r\theta$$

2) convert linear speed of chain to angular speed on the rear sprocket,

$$\theta = \frac{r}{s}$$

3) convert angular speed to linear speed, using the radius of the rear tire.

$$1) \left(\frac{1.4 \text{ rev front}}{\text{sec}} \right) \left(\frac{(5 \text{ in}) (2\pi \text{ rad})}{1 \text{ rev front}} \right) = \left(\frac{7}{5} \right) (10\pi) \frac{\text{in}}{\text{sec}}$$

Linear Speed of Chain

$$= 14\pi \frac{\text{in}}{\text{sec}} = 14\pi \frac{\text{in}}{\text{sec}} \left(\frac{1}{3 \text{ in}} \right) \left(\frac{14\pi \text{ in}}{\text{sec}} \right) \text{ radians/sec}$$

Angular Speed of Rear wheel

$$\text{from } \theta = \frac{r}{s}$$

3) Now, use radius on back tire

$$s = r\theta = \left(\frac{14\pi \text{ radians}}{\text{sec}} \right) (15 \text{ in radius}) = \frac{35\pi \text{ in}}{\text{sec}} = \frac{6}{35\pi} \frac{\text{ft}}{\text{sec}} \approx 18.3 \frac{\text{ft}}{\text{sec}} \approx 12.5 \frac{\text{m}}{\text{hr}}$$

Linear Speed of Bike

6

$$f(x) = 8 \sin\left(\frac{\pi}{14}x - \frac{5\pi}{14}\right) + 13$$

$$= \sin\left(\frac{\pi}{14}(x-5)\right) + 13$$

Amplitude

$$\frac{\pi}{14}x = 2\pi$$

$$x = \left(2\pi\right)\left(\frac{14}{\pi}\right) = 28$$

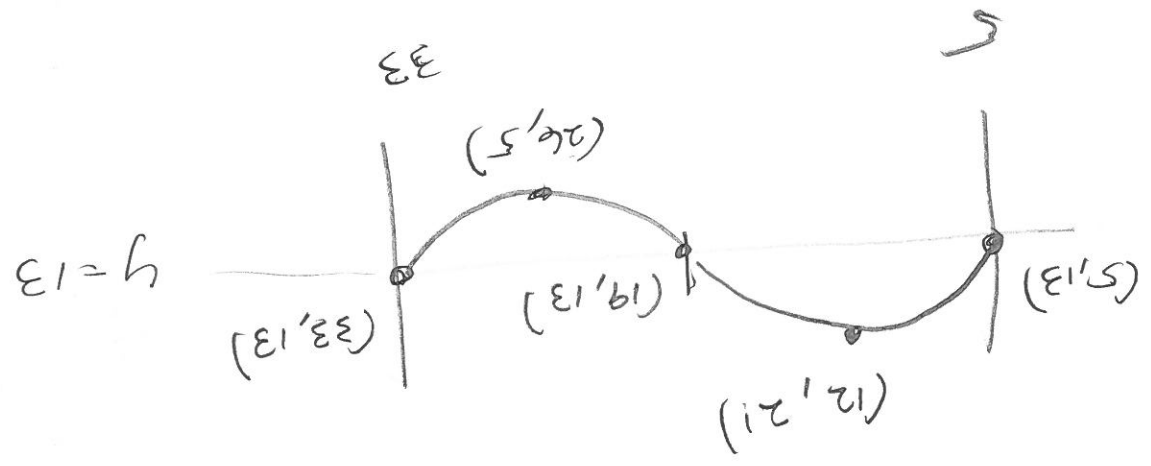
$$x = 28 = T$$

100%

$$y = 13$$

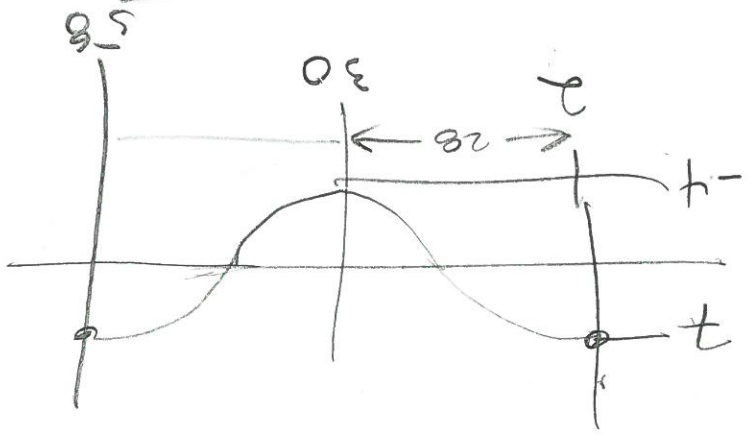
Midline

Start at $x = 5$



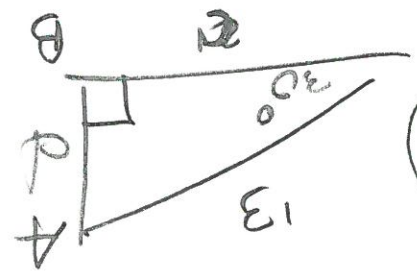
7

122 TEST 1



$$\frac{11}{28} \cos\left(\frac{11}{28}(x-2)\right) + \frac{3}{2}$$

$$7 - \frac{2}{2} = \frac{14-3}{2} = \frac{11}{2}$$



$$\begin{aligned} B &= 90^\circ \\ A &= 60^\circ \end{aligned}$$

$$d = 13 \cos(30^\circ)$$

$$\frac{13\sqrt{3}}{2} = c$$

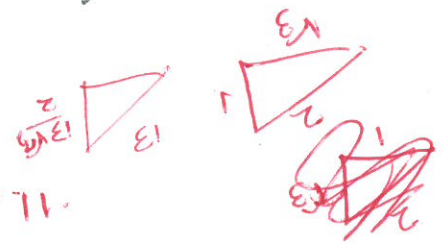
$$\frac{13}{2} = d = 6.5$$

5pts

$$\begin{aligned} T &= 5 \\ 56b &= 2\pi \\ b &= \frac{2\pi}{56} \end{aligned}$$

10pts

8



$$\frac{13}{2} \cos\left(\frac{11}{28}\right) = \frac{13}{2}$$

5pts

9

$$\frac{13}{2} \cos\left(\frac{11}{28}\right) = \frac{13}{2}$$

5pts

9

$$\frac{13}{2} \cos\left(\frac{11}{28}\right) = \frac{13}{2}$$

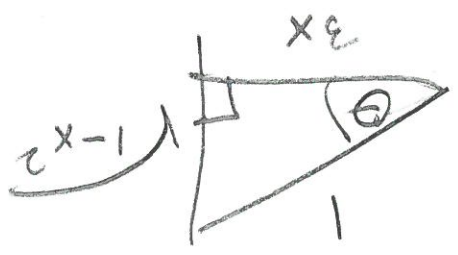


$$\frac{13}{2} \cos\left(\frac{11}{28}\right) = \frac{13}{2}$$

$$\frac{13}{2} \cos\left(\frac{11}{28}\right) = \frac{13}{2}$$

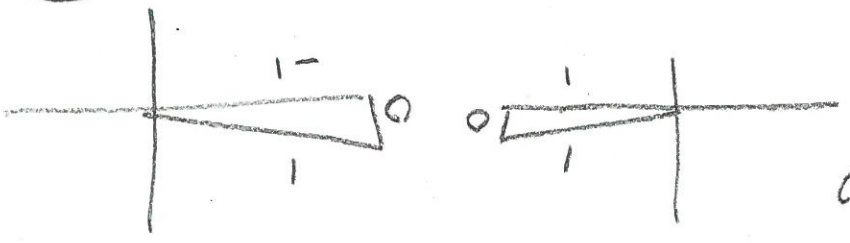
10

$$\sin(\arccos(3x)) = \sqrt{\frac{1}{2}(3x)^2} = \sqrt{1-9x^2}$$



SQ3

11:26 modulo
10 min chat
still longish

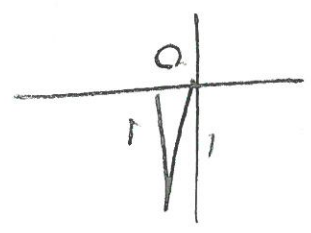


11 2

$$\sin x = 0$$

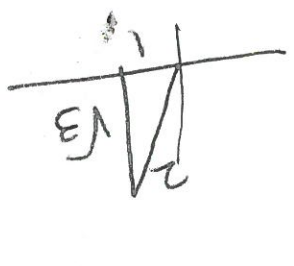
9

$$\sin x = 1$$



8

$$\sin x = \frac{2}{3}$$

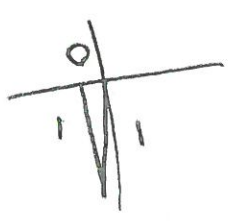
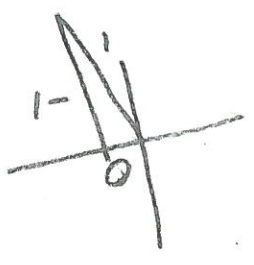
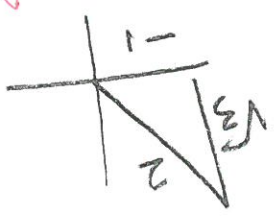


7

$$\sin x = \frac{1}{\sqrt{2}}$$

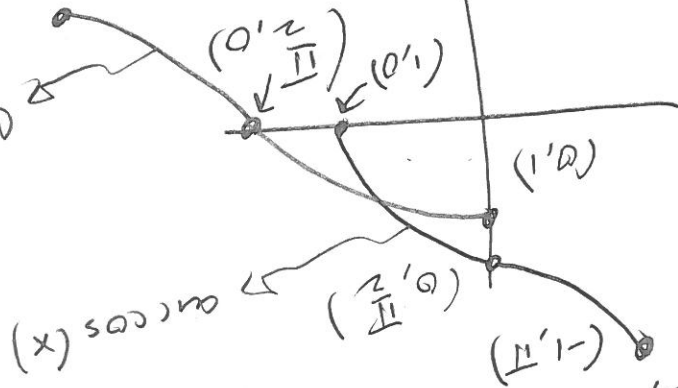
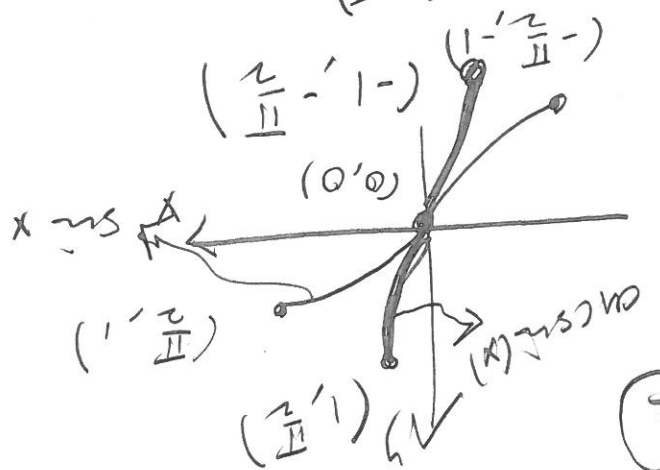


Class isn't
drawing enough
triangles.



$$\cos x = 0$$

12



$(\pi, -1)$

$(0, \frac{\pi}{2})$

$(1,0)$

$(0,1)$

$(-1,0)$

$(0,-1)$

$(\pi, -1)$

$(0, \frac{\pi}{2})$

$(1,0)$

$(0,1)$

$(-1,0)$

$(0,-1)$

$(\pi, -1)$

5B

5B

5) $\left(\frac{1.4 \text{ rev}}{\text{sec}} \right) \left(\frac{1 \text{ rev}}{(5)(2\pi) \text{ linear inches}} \right) = \left(\frac{14}{10} \right) (10\pi) = 14\pi \frac{\text{in}}{\text{sec}}$

is chain's speed in $\frac{\text{in}}{\text{sec}}$.

$\left(\frac{\text{arc length}}{\text{sec}} \right) = \left(\frac{\text{angular speed in radians}}{\text{sec}} \right)$

radius $\frac{14 \frac{1}{2} \text{ in}}{2} = 14 \frac{1}{2} \pi \frac{\text{radians}}{\text{sec}} = \frac{3}{14} \pi \frac{\text{radians}}{\text{sec}}$

Bike's speed: convert radians/sec to

linear speed:

$s = r\theta = (15 \text{ in}) \left(\frac{14}{3} \pi \frac{\text{radians}}{\text{sec}} \right) = \left(\frac{5}{4} \right) \left(\frac{14}{3} \pi \frac{\text{ft}}{\text{sec}} \right) = \left(\frac{1}{12} \frac{\text{m}}{\text{ft}} \right) \left(\frac{1}{3} \frac{\text{ft}}{\text{sec}} \right) = \left(\frac{1}{3600 \text{ sec}} \right) \left(\frac{1 \text{ m}}{5280 \text{ ft}} \right) \left(\frac{3600 \text{ sec}}{\text{hr}} \right) = \frac{12.5 \text{ m}}{\text{hr}}$

15
45
90
135
180
225
270
315
360
405
450
495
540
585
630
675
720
765
810
855
900
945
990
1035
1080
1125
1170
1215
1260
1305
1350
1395
1440
1485
1530
1575
1620
1665
1710
1755
1800
1845
1890
1935
1980
2025
2070
2115
2160
2205
2250
2295
2340
2385
2430
2475
2520
2565
2610
2655
2700
2745
2790
2835
2880
2925
2970
3015
3060
3105
3150
3195
3240
3285
3330
3375
3420
3465
3510
3555
3600