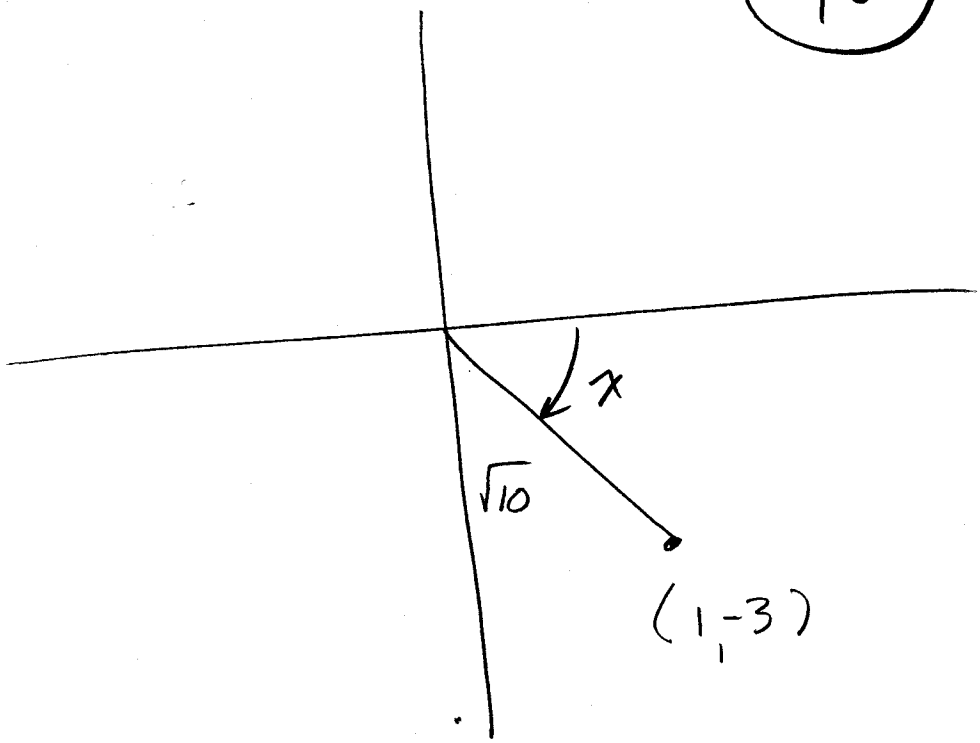
5 pts

(1) Given $\tan x = -3$, $-\pi/2 < x < 0$

40



$$\cos x = \frac{1}{\sqrt{10}} = \frac{\sqrt{10}}{10}$$

$$\sin x = -\frac{3}{\sqrt{10}} = -\frac{3\sqrt{10}}{10}$$

$$\cot x = -\frac{1}{3}$$

$$\sec x = \sqrt{10}$$

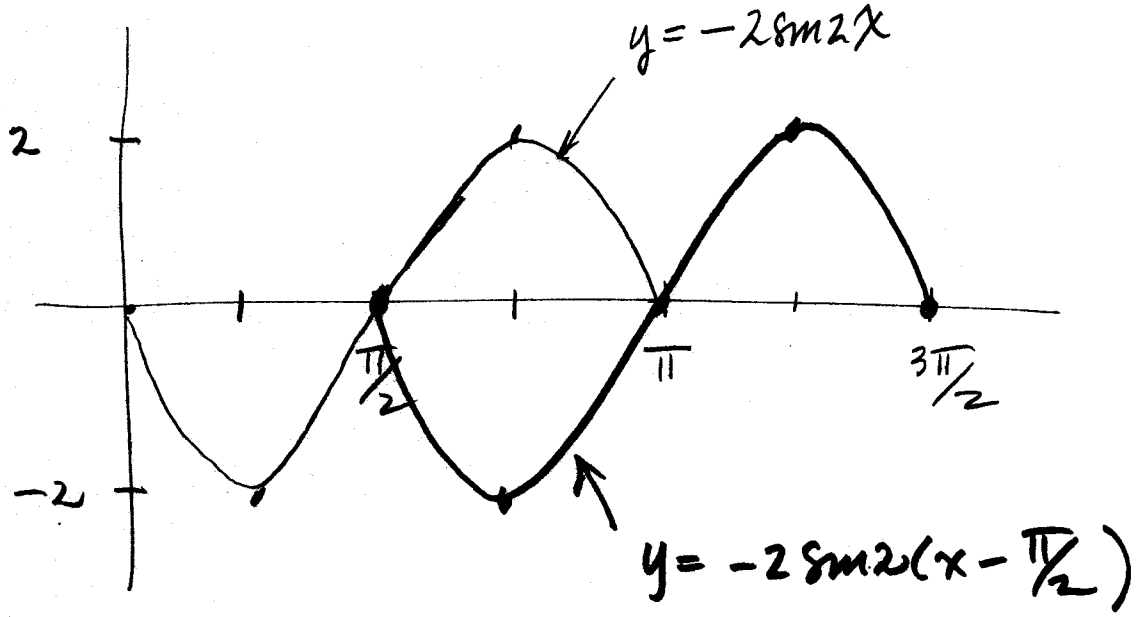
$$\csc x = -\frac{\sqrt{10}}{3}$$

5 pts

(2a) $y = -2\sin 2(x - \pi/2)$

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

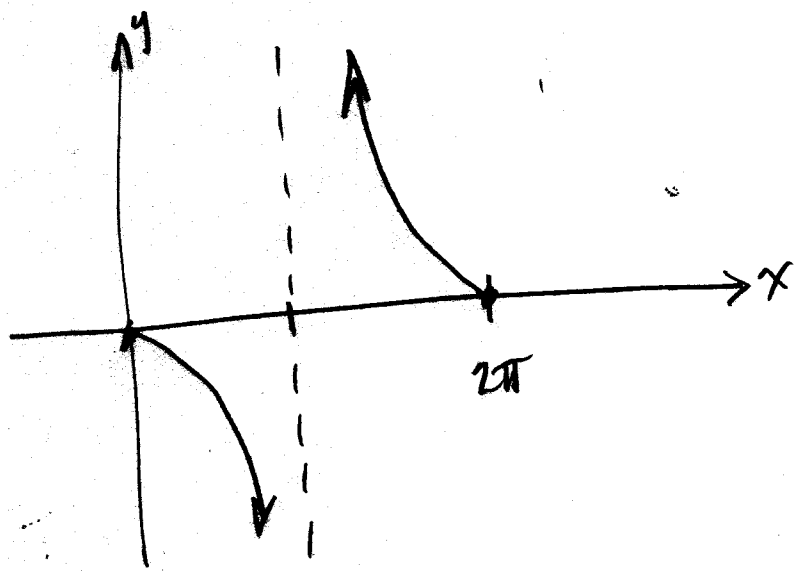
$A = |-2| = 2$



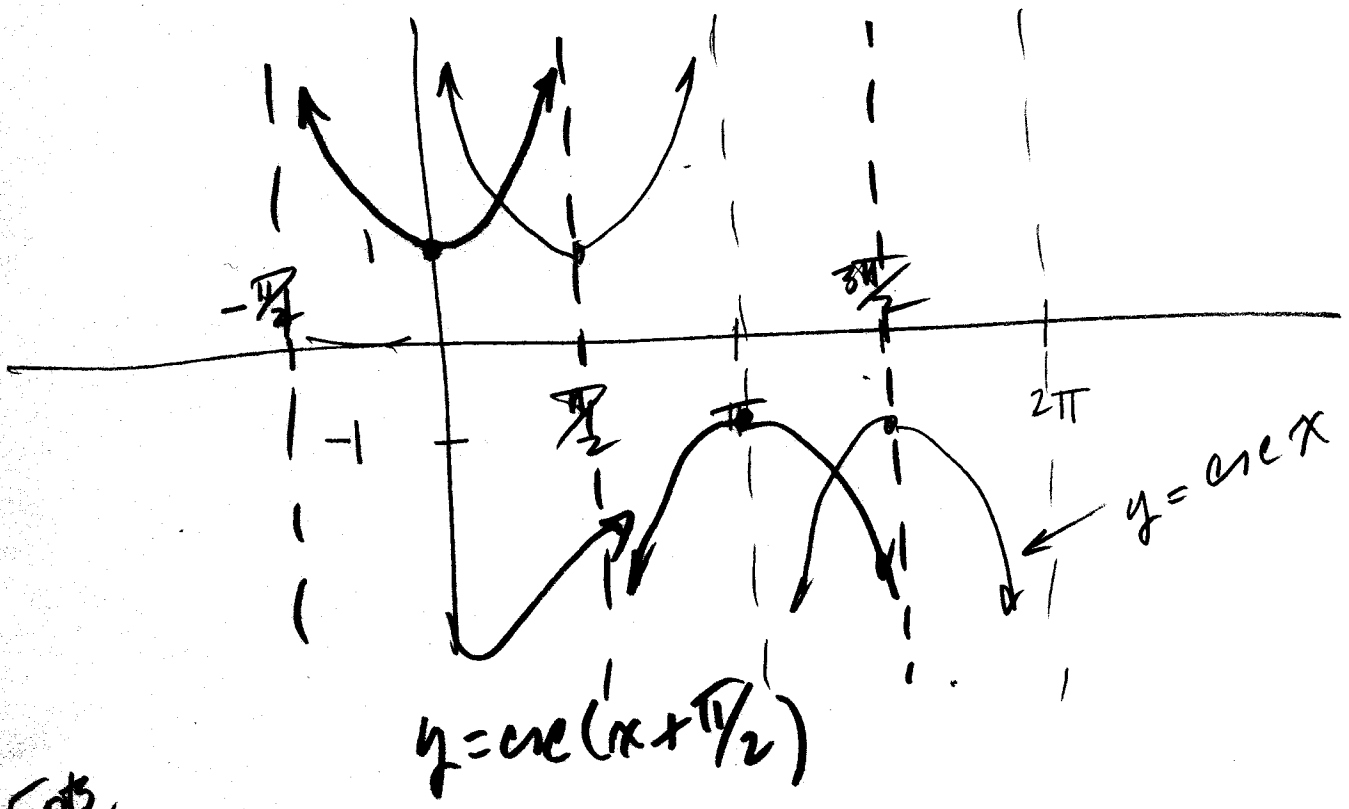
5 pts

(2b) $y = -\tan \frac{1}{2}x$

$T = \frac{\pi}{\frac{1}{2}} = 2\pi$

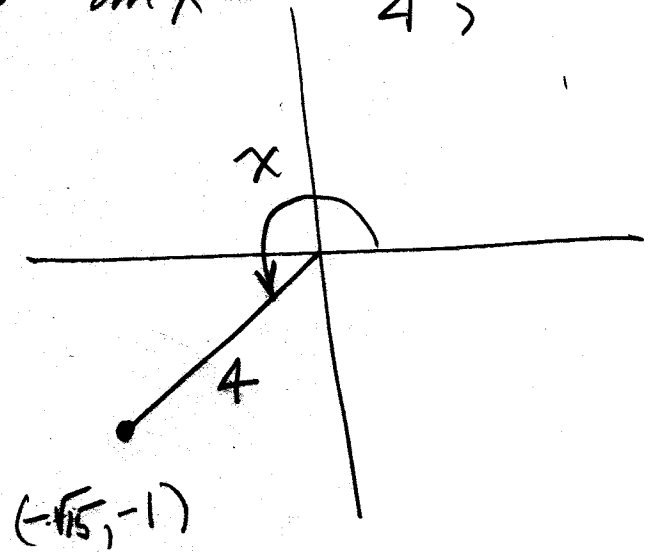


5 pts (2c) $y = \csc\left(x + \frac{\pi}{2}\right)$



$y = \csc\left(x + \frac{\pi}{2}\right)$

5 pts (3) $\sin x = -\frac{1}{4}, \quad \pi < x < \frac{3\pi}{2}$



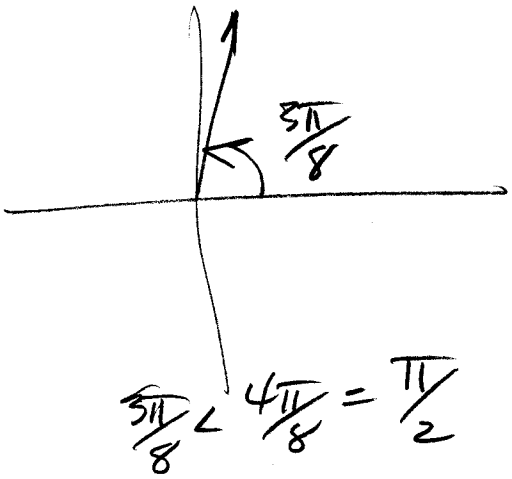
$\sin 2x$

$= 2\sin x \cos x$

$= 2\left(-\frac{1}{4}\right)\left(-\frac{\sqrt{15}}{4}\right)$

$= \frac{\sqrt{15}}{8}$

Sp8 (4) $\cos\frac{3\pi}{8}$



$$= \sqrt{\frac{1+\cos\frac{3\pi}{4}}{2}}$$

$$= \sqrt{\frac{1+\sqrt{2}/2}{2^2}}$$

$$= \sqrt{\frac{2+\sqrt{2}}{4}}$$

$$= \frac{\sqrt{2+\sqrt{2}}}{2}$$

Sp8 (5) Prove: $\cot s + \tan s = \sec s \csc s$.

By $\cot s + \tan s = \frac{\cos s}{\sin s} + \frac{\sin s}{\cos s}$

$$= \frac{\cos^2 s}{\cos s \sin s} + \frac{\sin^2 s}{\cos s \sin s}$$

$$= \frac{\cos^2 s + \sin^2 s}{\cos s \sin s}$$

$$= \frac{1}{\cos s \sin s}$$

$= \frac{1}{\cos s} \cdot \frac{1}{\sin s}$

$= \sec s \csc s$

5 pts

(6) Prove: $\frac{\sin 2\theta}{1+\cos 2\theta} = \tan\theta$

By $\frac{\sin 2\theta}{1+\cos 2\theta} = \frac{2\sin\theta\cos\theta}{1+(2\cos^2\theta - 1)}$

$= \frac{2\sin\theta\cos\theta}{2\cos^2\theta}$

$= \frac{\sin\theta}{\cos\theta}$

$= \tan\theta$

1) c

2) b

3) a

4) d

5) a

6) c

7) c

8) e

9) c

10) d

11) a b

12) e

13) c