

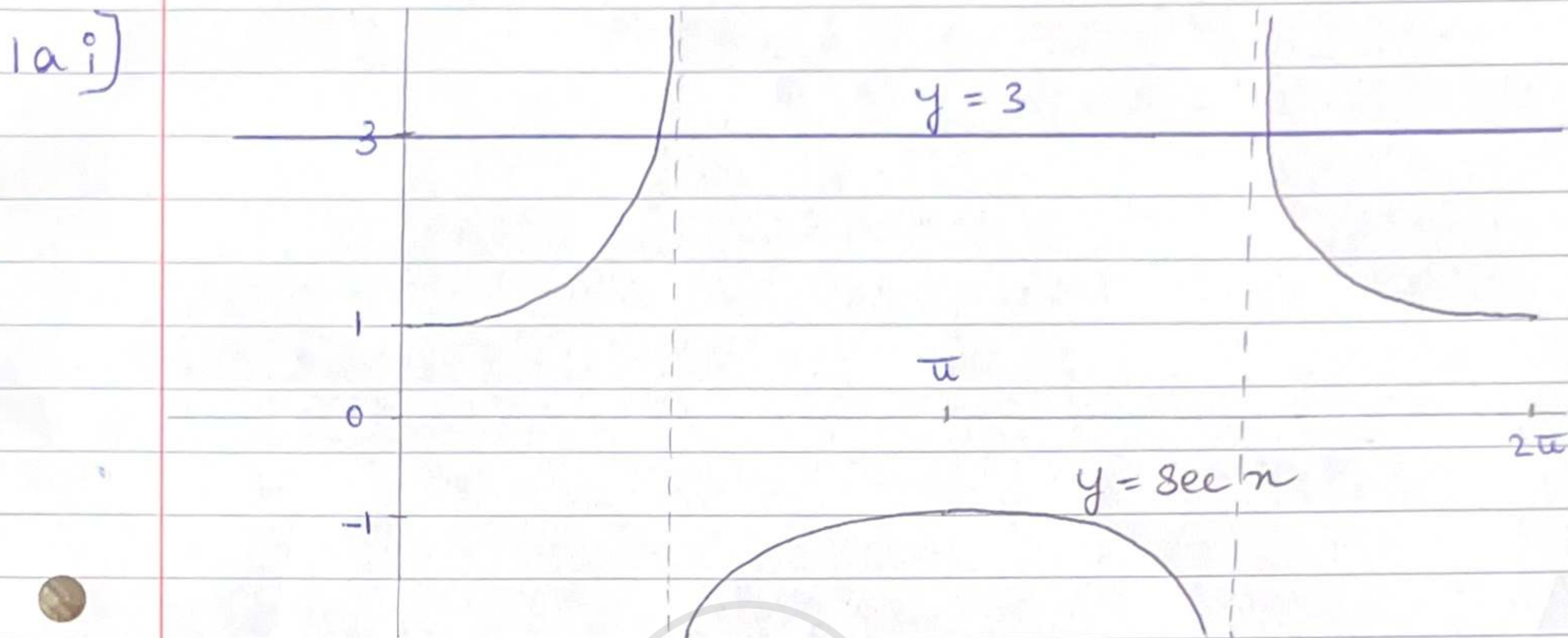
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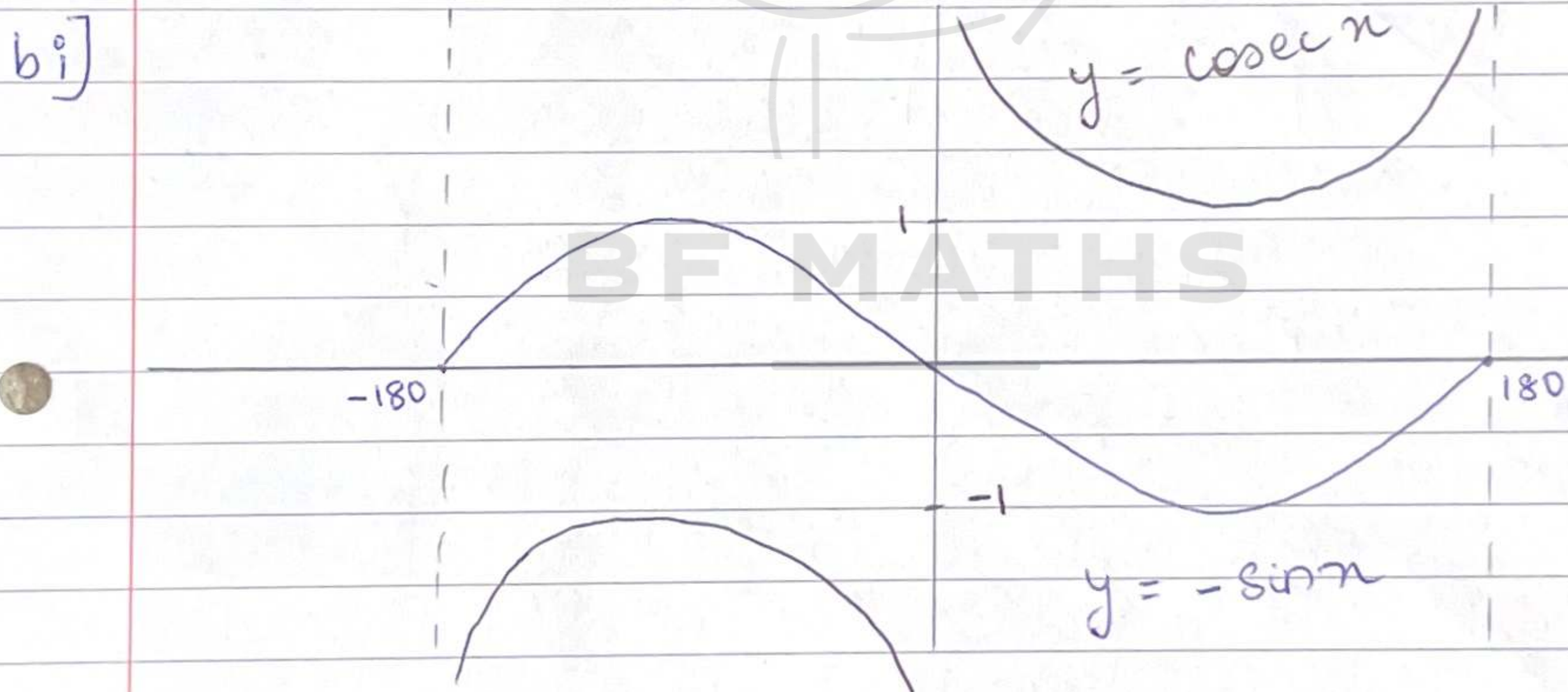
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## 6.2 Graphs of Sec $\theta$ , Cosec $\theta$ , Cot $\theta$



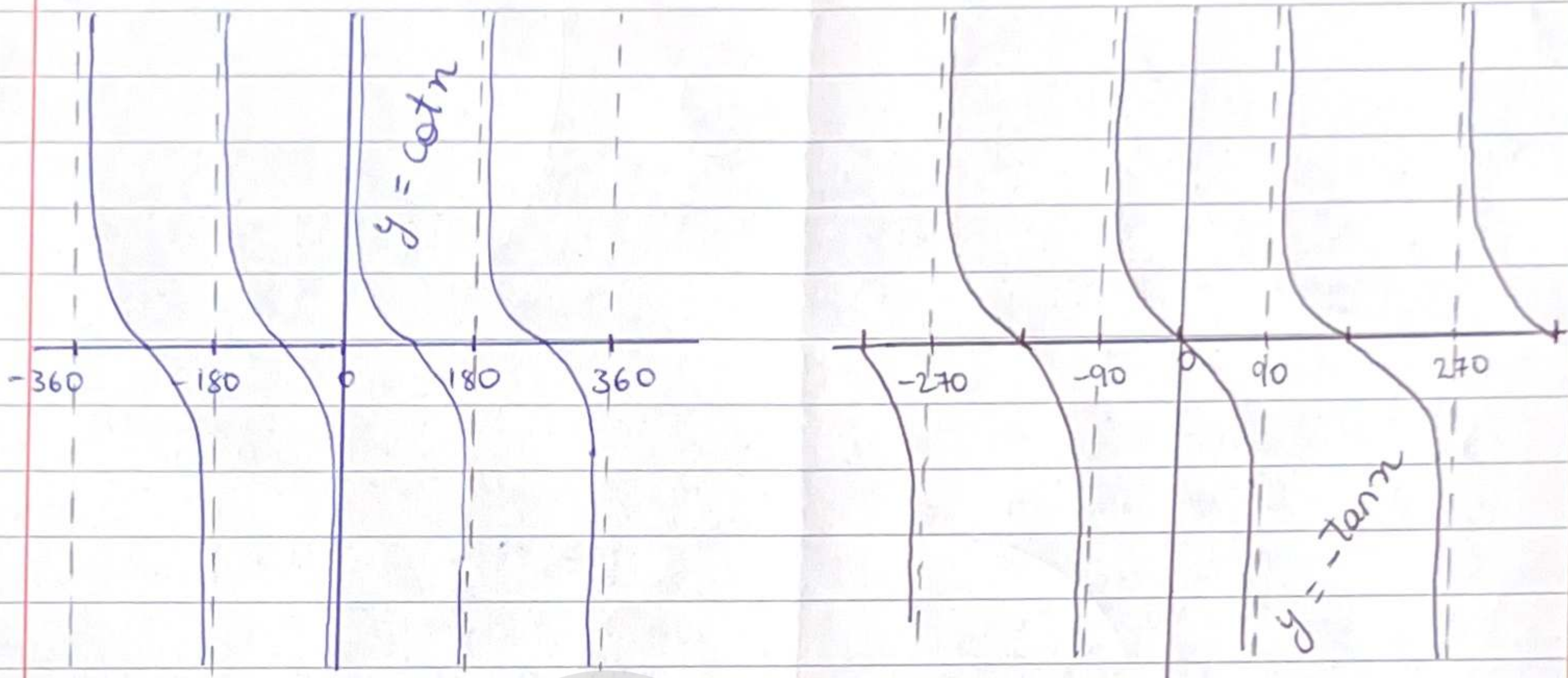
ii) Since the graph meets at 2 points, It has 2 solutions.



ii) The graphs do not intersect.

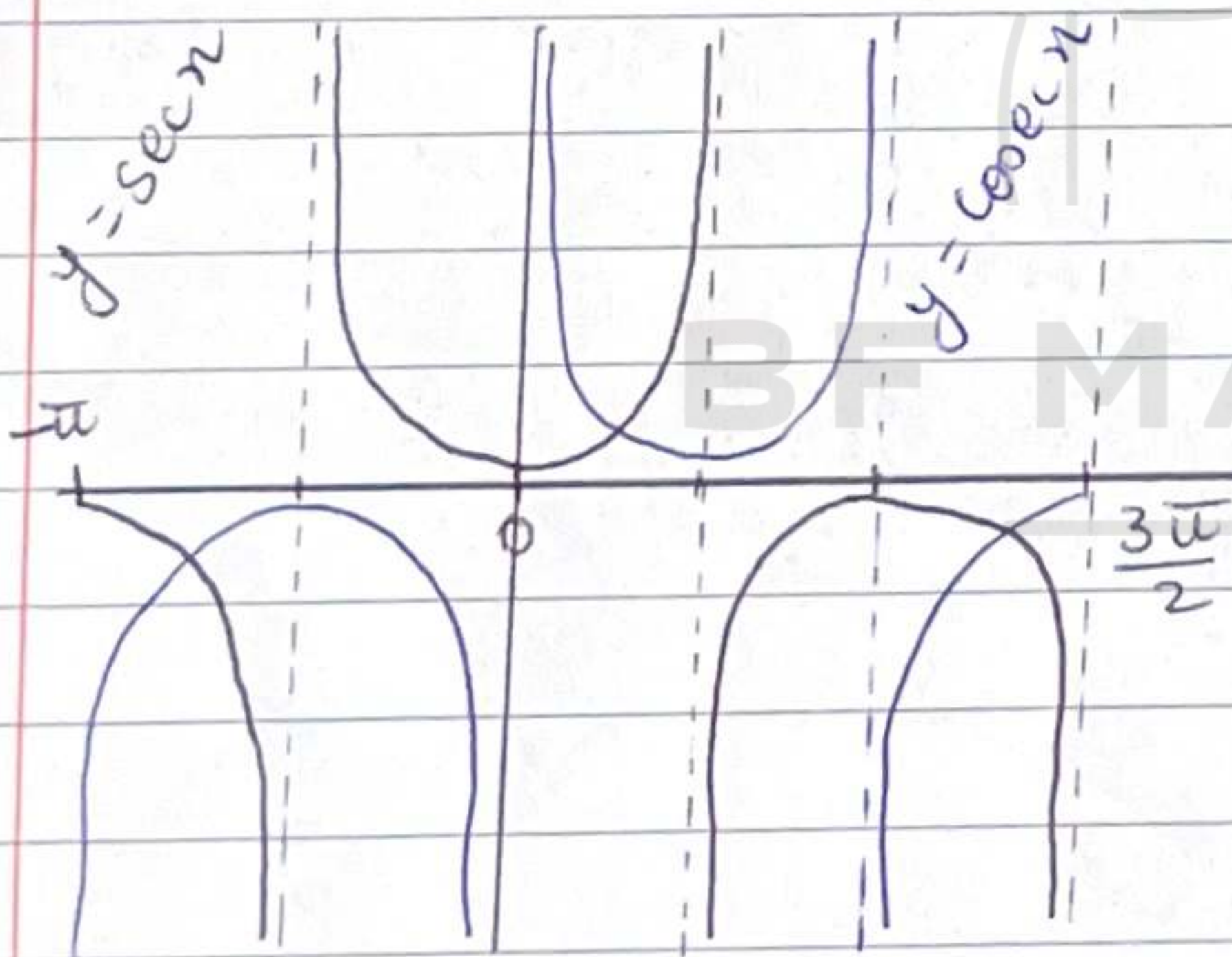
## 6.2 Graphs of $\sec n$ , $\operatorname{cosec} n$ , $\cot n$

2a i)



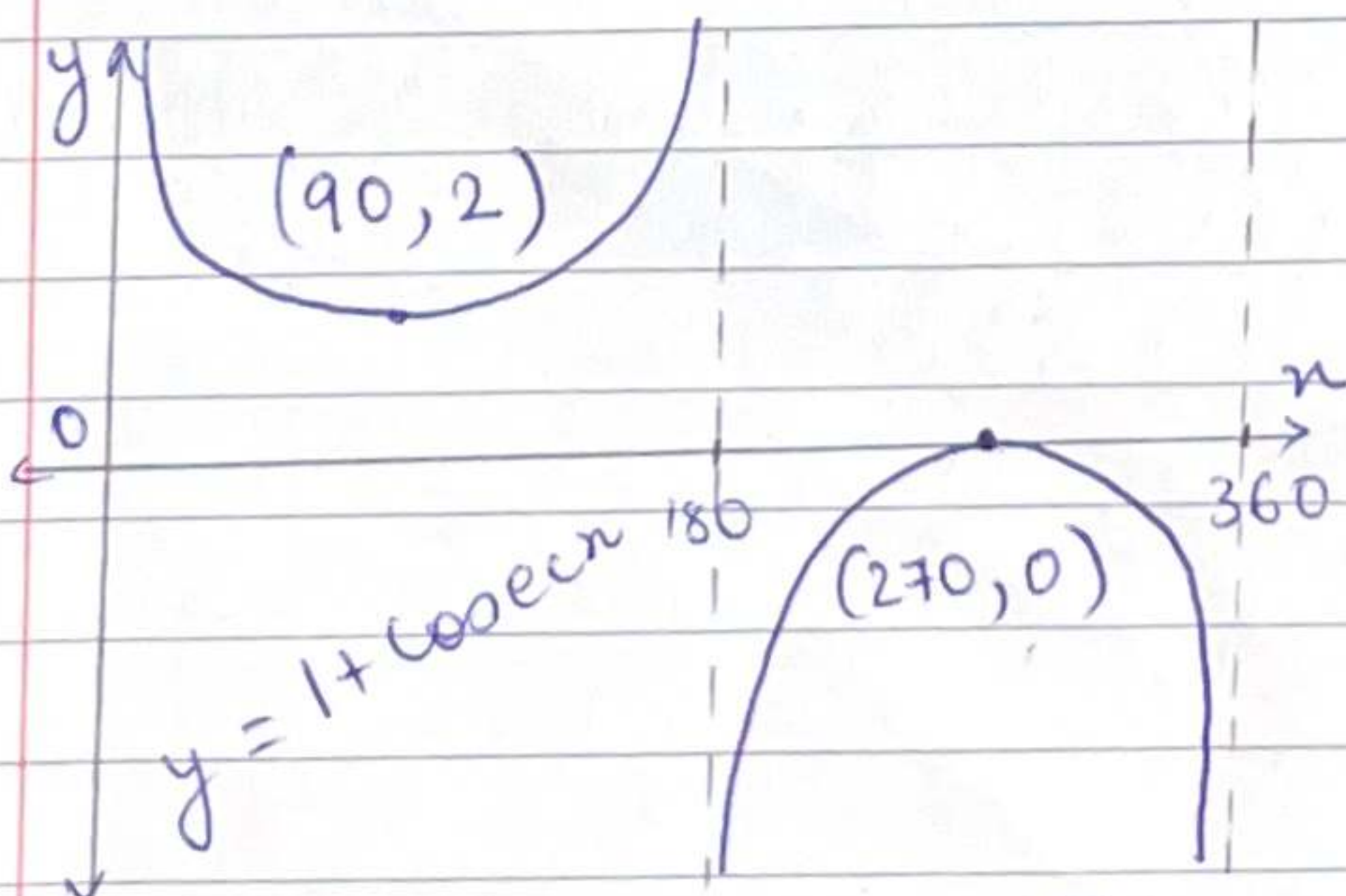
ii) The graph of  $y = \cot n$  is the same as that of  $y = -\tan n$  translated by  $90^\circ$  in the positive or negative  $n$ -direction.

b i)

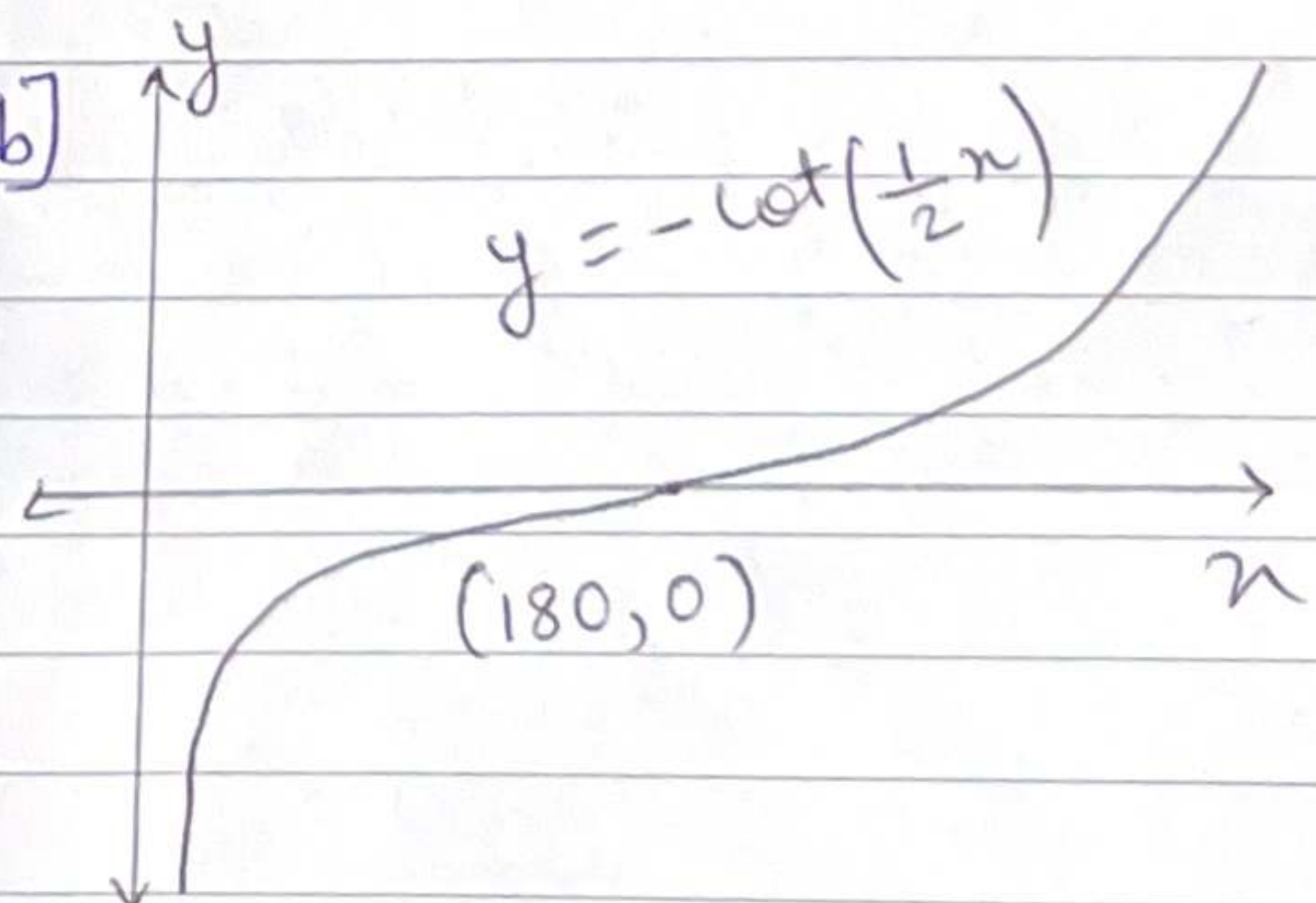


ii) The graph of  $\operatorname{cosec} n$  is the same as that of  $\sec n$  translated by  $\frac{\pi}{2}$  in the positive  $n$ -direction.

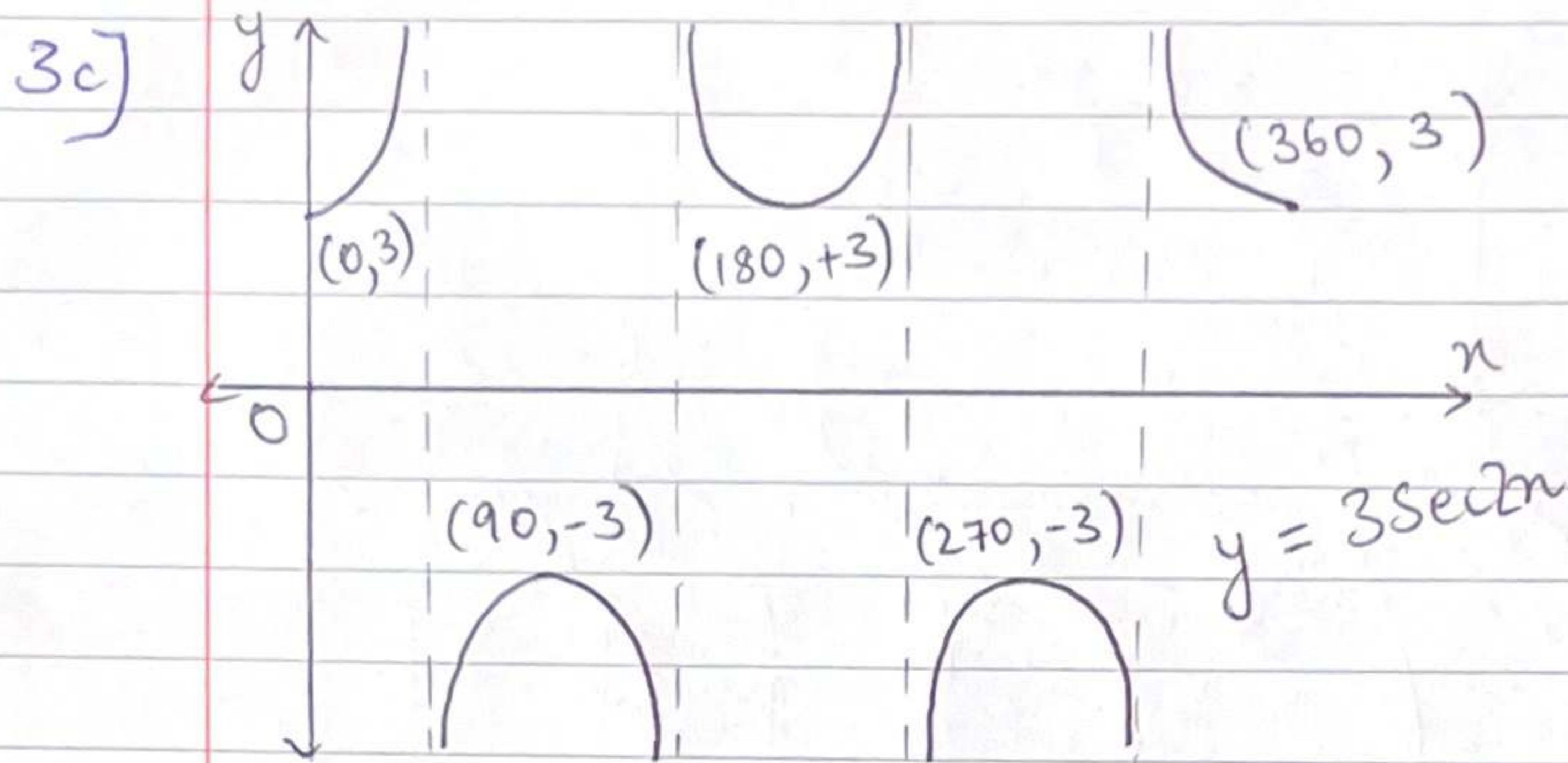
3a)



b)



## 6.2 Graphs of $\sec n$ , $\operatorname{cosec} n$ , $\cot n$



4a)  $y = \operatorname{cosec} \left( n + \frac{\pi}{4} \right)$

$$0 \leq n \leq 4\pi$$

when  $n = 0$

$$y = \operatorname{cosec} \left( 0 + \frac{\pi}{4} \right)$$

$$y = \frac{1}{\sin \frac{\pi}{4}}$$

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

$(0, \sqrt{2})$

4c)  $n = \frac{3\pi}{4}$

$$n = \frac{7\pi}{4}$$

$$n = \frac{11\pi}{4}$$

$$n = \frac{15\pi}{4}$$

4b) The turning points for

$$y = \operatorname{cosec} n$$

$$\left( \frac{\pi}{2}, 1 \right), \left( \frac{3\pi}{2}, -1 \right), \left( \frac{5\pi}{2}, 1 \right)$$

$$\text{and } \left( \frac{7\pi}{2}, -1 \right)$$

Since the graph has moved to the left by  $\frac{\pi}{4}$

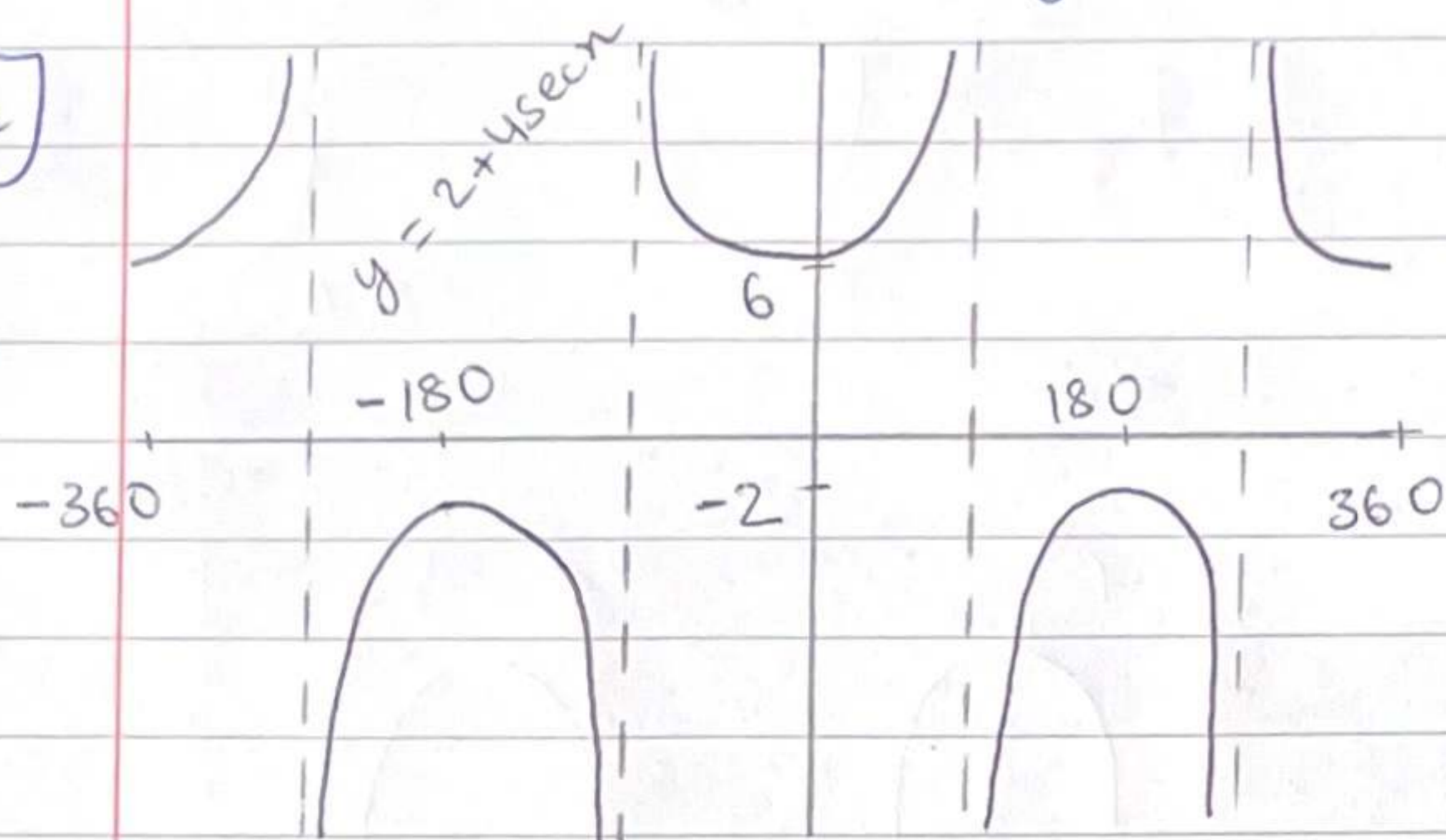
The coordinates for  $y = \operatorname{cosec} \left( n + \frac{\pi}{4} \right)$  is

$$\left( \frac{\pi}{4}, 1 \right), \left( \frac{9\pi}{4}, 1 \right), \left( \frac{5\pi}{4}, -1 \right)$$

$$\text{and } \left( \frac{13\pi}{4}, -1 \right)$$

## 6.2 Graphs of Sec n, cosec n, Cot n

5a)



b)  $-2 < a < 6$

6a) 3 solutions.

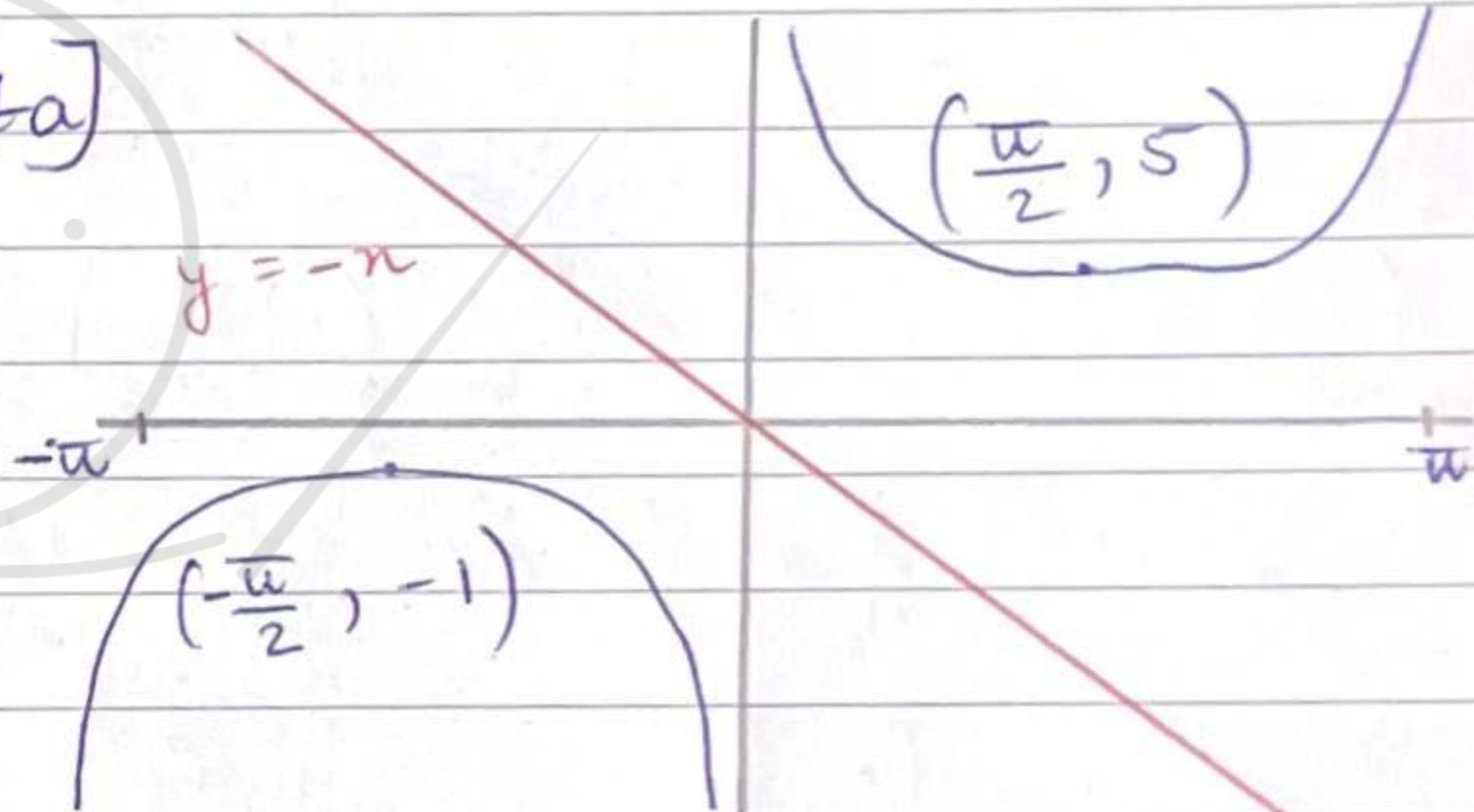
6b)  $\cot 3n = 0$   
 $\cot n$  is 0 at  $90^\circ, 270^\circ, 450^\circ$

$$0 \leq n < 540$$

$$3n = 90, 270, 450$$

$$n = 30, 90, 150$$

7a)



7b) 0 solutions

7c)  $y = 2 + 3\operatorname{cosec} n \Rightarrow \frac{1}{2 + 3\operatorname{cosec} n} \Rightarrow \frac{1}{2 + 3\left(\frac{1}{\sin n}\right)}$

$$\Rightarrow \frac{1}{2 + \frac{3}{\sin n}} \Rightarrow \frac{1}{2\sin n + 3} \times \frac{\sin n}{1}$$

$$\Rightarrow \frac{\sin n}{2\sin n + 3}$$

When  $\sin n = \frac{\pi}{2}$

$$\Rightarrow \frac{1}{2(1) + 3} \Rightarrow \frac{1}{5}$$