

هم رخصت

تالیف شماره ۲۰

درسالیولی

سؤال ۱) $\sin 135^\circ = \frac{\sqrt{2}}{2}$, $\sin 150^\circ = -\frac{\sqrt{2}}{2}$, $\cos 135^\circ = -\frac{\sqrt{2}}{2}$, $\cos 150^\circ = -\frac{\sqrt{3}}{2}$ (الف)

$$\rightarrow \left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}\right) = \frac{2}{4} - \frac{3}{4} = \frac{-1}{4}$$

ب) $\frac{1 + \tan^2 21^\circ}{4 \cos^2 135^\circ + 2 \cos^2 150^\circ} = \frac{1 + \left(\frac{\sqrt{3}}{2}\right)^2}{4\left(\frac{\sqrt{2}}{2}\right)^2 + 2\left(-\frac{\sqrt{3}}{2}\right)^2} = \frac{1+1}{3+1} = \frac{2}{4} = \frac{1}{2}$

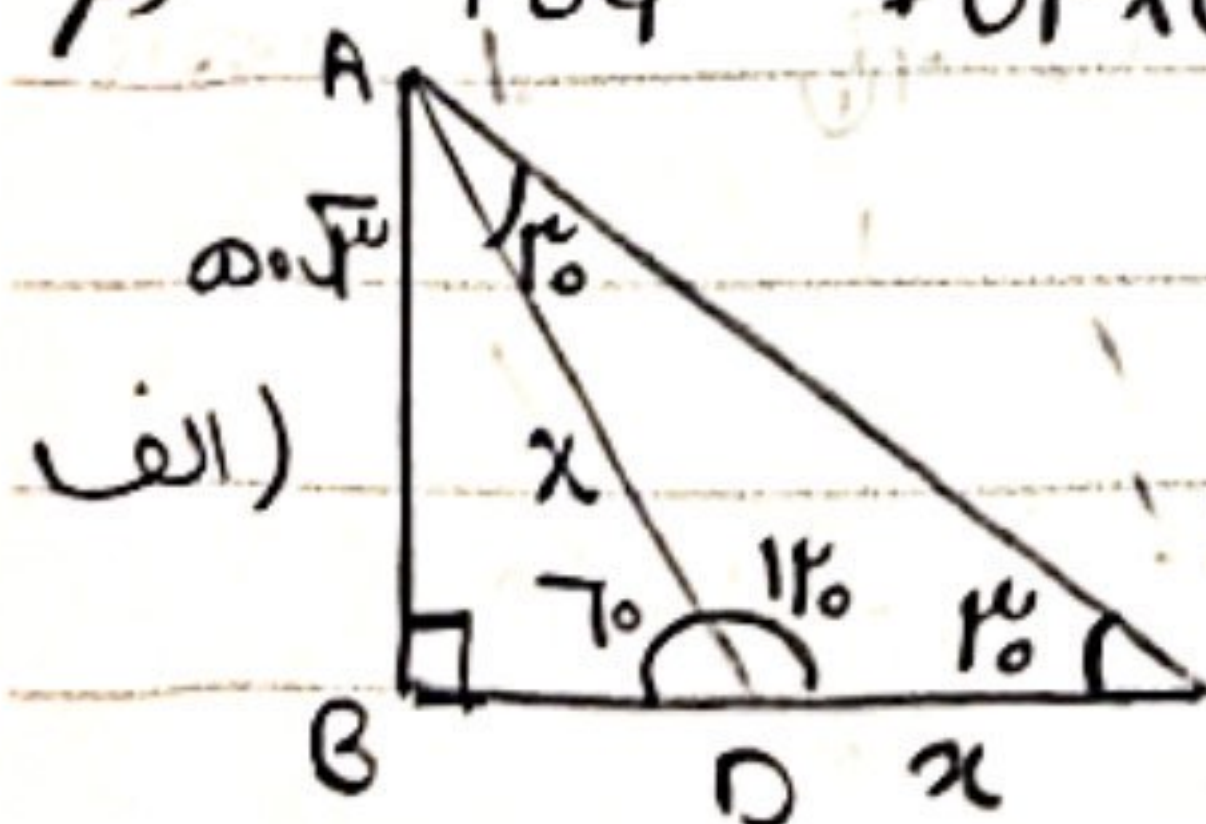
الف) $AH = \sin 45^\circ \times AB = \frac{\sqrt{2}}{2} \times \sqrt{4} = \frac{\sqrt{12}}{2}$ (سؤال ۲)

$$HC^2 = (2\sqrt{3})^2 - \left(\frac{\sqrt{12}}{2}\right)^2 = 12 - 3 = 9 \rightarrow HC = 3$$

ب) $\frac{\sqrt{3}}{2} AC = 9 \rightarrow AC = 9 \times \frac{2}{\sqrt{3}} = 9 \times \frac{2\sqrt{3}}{3} = 6\sqrt{3}$

$$\Rightarrow AH = 3^\circ \text{ زاویه } = 6\sqrt{3} \times \frac{1}{2} = 3\sqrt{3}$$

$\sin = \frac{\text{مقابل}}{\text{وتر}} = \frac{3\sqrt{3}}{6\sqrt{3}} = \frac{3\sqrt{3}}{3\sqrt{3} \times \sqrt{2}} = \frac{\sqrt{2}}{2} \rightarrow \sin ? \text{ زاویه این برابر } \frac{\sqrt{2}}{2} \Rightarrow B = 45^\circ$



سؤال ۳) با توجه شکل مثلث ADC مساوی

المساوی است ←

$$AD \times \sin 70^\circ = AB$$

$$\rightarrow AD = AB \div \sin 70^\circ = 50\sqrt{2} \times \frac{2}{\sqrt{2}} = 100$$

$$x = 100$$

وفات آیت الله سید محمود طالقانی اولین امام جمعه تهران (۱۳۵۸ هـ ش)

۲۰

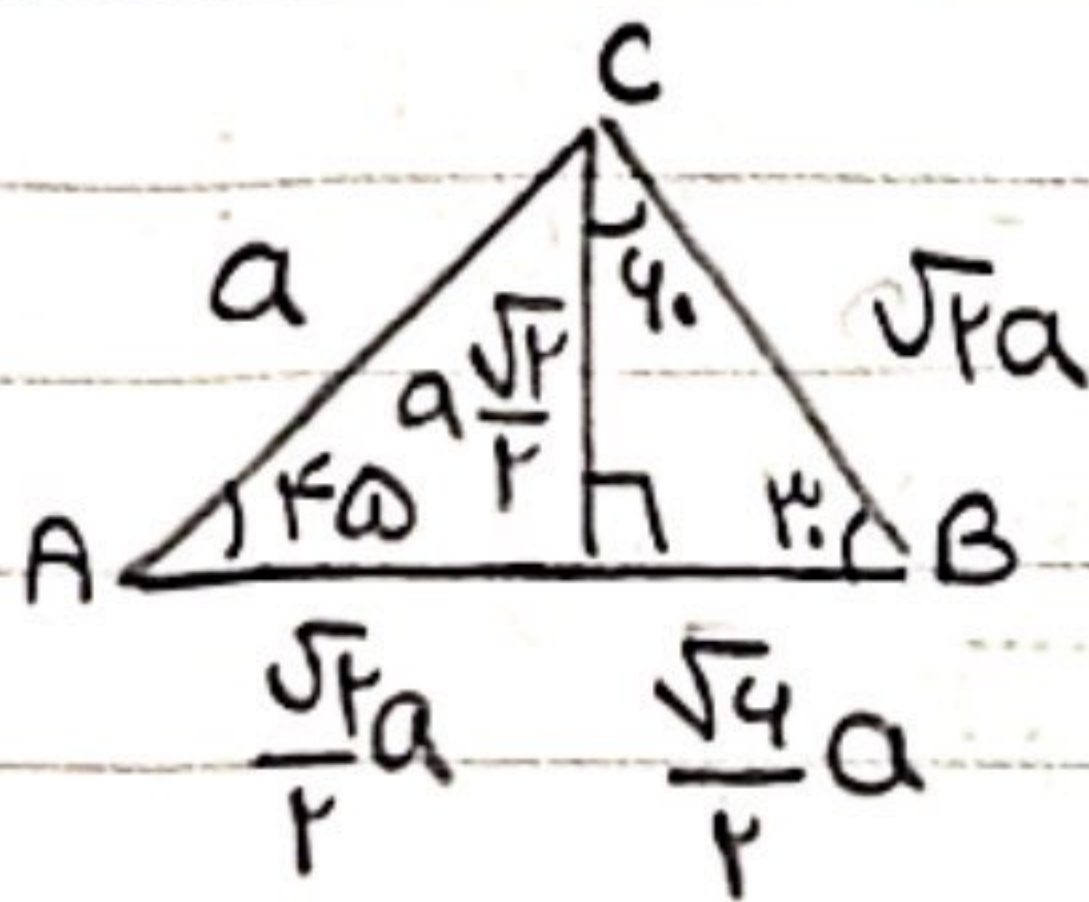
۱۴ صفر ۱۴۴۴ | شہر یور

یکشنبہ | Sun. 11 Sep. 2022

$$\tan 70^\circ = \frac{BC}{AB} \rightarrow \frac{\sqrt{13}}{1} = \frac{1}{12} \rightarrow BC = 12\sqrt{13}$$

$$DC = \sqrt{BD^2 + BC^2} = \sqrt{1 + 12^2} = \sqrt{13}$$

$$\sin \alpha = \frac{DB}{DC} = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$$



$$\frac{AB}{AC} = \frac{a \left(\frac{\sqrt{2} + \sqrt{4}}{2} \right)}{a} = \frac{\sqrt{2} + \sqrt{4}}{2}$$

سؤال ۱۴

$$S_{\triangle ABE} = \frac{1}{2} \times BE \times AB \times \sin \alpha$$

$$\frac{S_{\triangle ABE}}{S_{\triangle BCD}} = \frac{\frac{1}{2} \times BE \times AB \times \sin \alpha}{\frac{1}{2} \times BC \times BD \times \sin \alpha} = \frac{2 \times 4}{4 \times 2} = \left(\frac{4}{2} \right)$$

سؤال ۱۵

α در ۲ قسٹ قسٹ برابر ہوں

سؤال ۱۶ ابتداً مساوی قسٹ اور پھر ۲۴ مرسم ہیں: (الف)

$$S_{\triangle ABC} = 3 \times 4 \times \sin 120^\circ = 12 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}$$

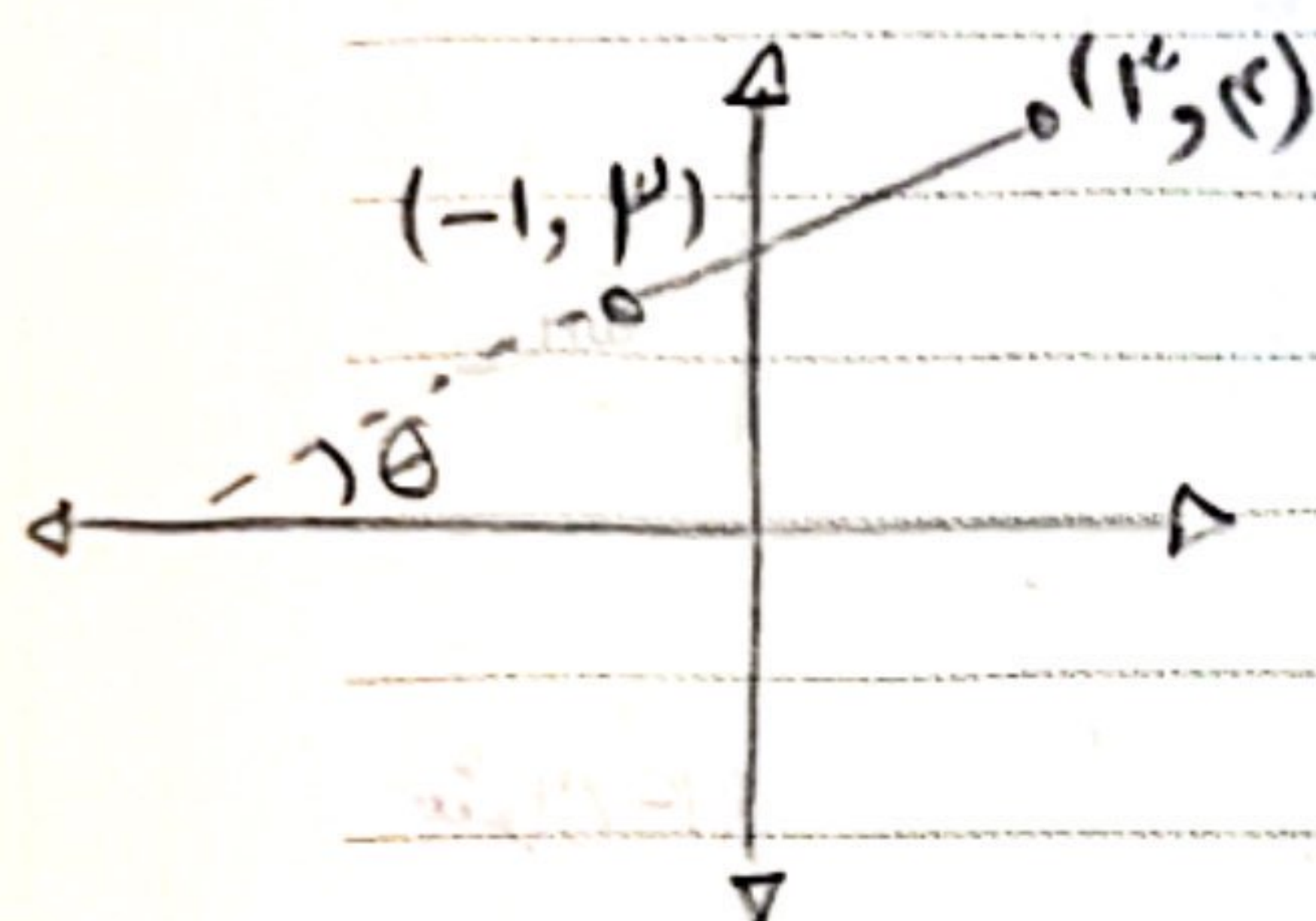
$$\rightarrow 3 \times 4 \times \sin 120^\circ = 12 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}$$

شہادت دومین شہید محراب آیت اللہ مدنی بہ دست منافقان (۱۳۶۰ ہش)

ب) متواری الاطلاق = $\frac{1}{2} ab \sin \alpha$

ادامہ سوال (۶)

$$\frac{1}{2} \times 12 \times 17 \sin 120^\circ = 7 \times \frac{\sqrt{3}}{2} = 12\sqrt{3}$$

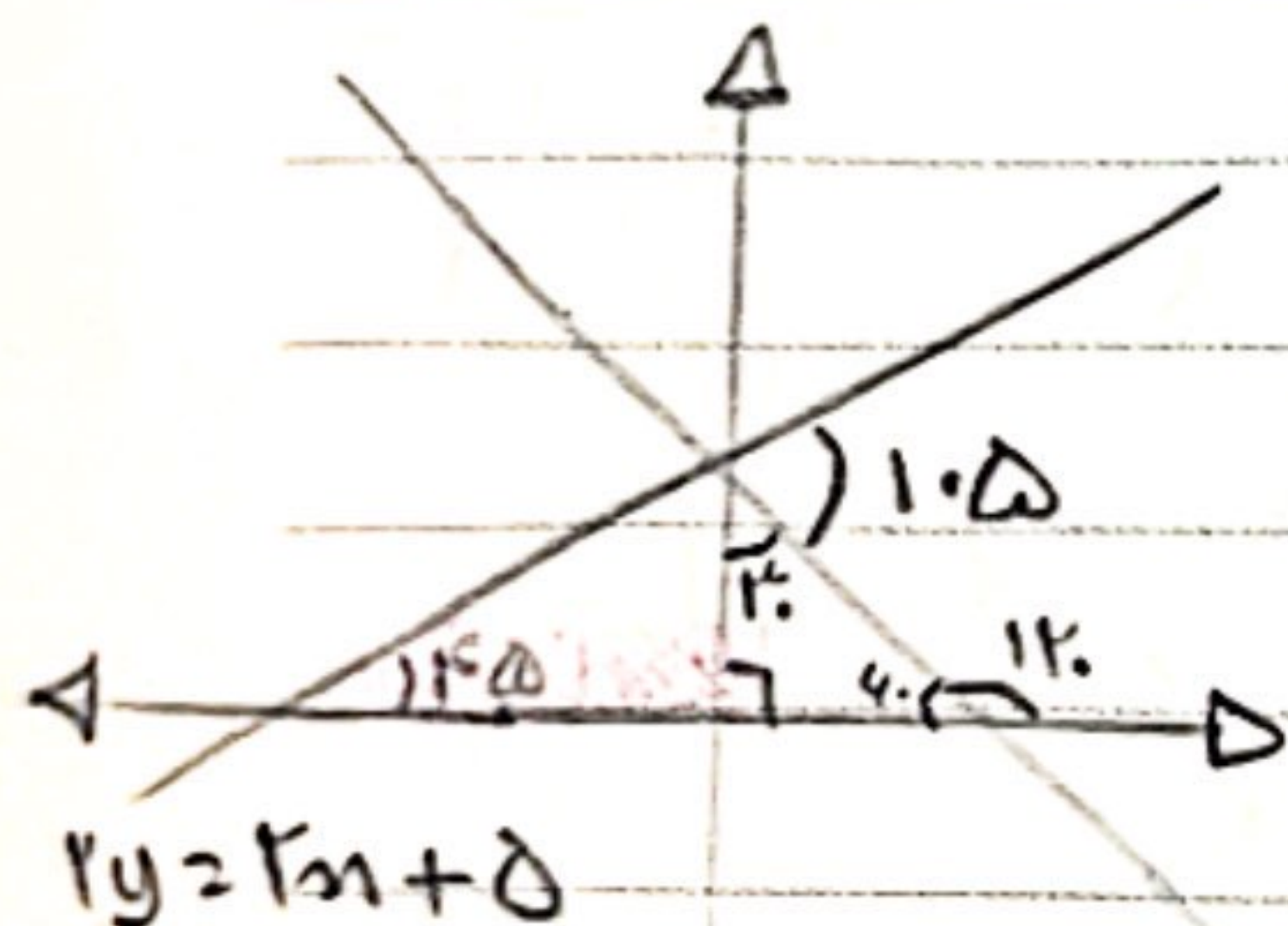


$$\text{شیب} = \frac{\Delta y}{\Delta x} = \frac{4-3}{1+1} = \frac{1}{2}$$

سوال (۷)

$$\tan \theta = \frac{1}{2} \rightarrow \tan \theta + 1 = \frac{1}{\cos^2 \theta}$$

$$\frac{1}{2} + \frac{1}{2} = \frac{1}{\cos^2 \theta} \rightarrow \cos \theta = \frac{2\sqrt{5}}{5}$$



$$y = x + \frac{5}{2}$$

سوال (۸)

$$\tan \theta = 1 \rightarrow \theta = 45^\circ$$

$$y = mx + b \quad \tan 120^\circ = \sqrt{3} \rightarrow m = -\sqrt{3}, b = \frac{5}{2}$$

$$mb = \frac{5}{2} \times -\sqrt{3} = \frac{-5\sqrt{3}}{2} \rightarrow y = -\sqrt{3}x + \frac{5}{2}$$

سوال (۱۴)

$$f\left(\frac{5\pi}{4}\right) = \cos\left(\pi + \frac{5\pi}{4}\right) + \sin\left(\frac{\pi}{2} - \frac{5\pi}{4}\right) - \tan\left(\frac{3\pi}{2} + \frac{5\pi}{4}\right)$$

$$= \cos\left(\frac{5\pi}{4}\right) - \cos\left(\frac{5\pi}{4}\right) - \cot\left(\frac{5\pi}{4}\right) = -\cot 150^\circ = \sqrt{3}$$

$$\rightarrow \cot 150^\circ = -\sqrt{3}$$

$$\frac{\sin\left(\frac{11\pi}{4} + x\right) + \cos\left(\frac{15\pi}{4} - x\right)}{\cos(12\pi + x) - \sin(4\pi - x)} = \frac{\sin\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right)}{\cos(\pi + x) - \sin(\pi - x)}$$

$$= \frac{\cos(x) - \sin(x)}{-\cos(x) + \sin(x)} = \frac{-(-\cos(x) + \sin(x))}{-\cos(x) + \sin(x)} = -1$$