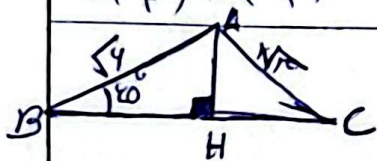


$$\left(\frac{\sqrt{r}}{r} + \frac{\sqrt{r}}{r}\right) \left(\frac{\sqrt{r}}{r} - \left(-\frac{\sqrt{r}}{r}\right)\right) = \left(\frac{\sqrt{r}-\sqrt{r}}{r}\right) \left(\frac{\sqrt{r}+\sqrt{r}}{r}\right) = \frac{r-r}{r} = \boxed{\frac{1}{r}} \quad \text{الف)}$$

$$\frac{1 + r \left(\frac{\sqrt{r}}{r}\right)^r}{r \left(\frac{\sqrt{r}}{r}\right)^r + r \left(-\frac{\sqrt{r}}{r}\right)^r} = \frac{1+1}{r+1} = \frac{r}{r} = \boxed{\frac{1}{r}} \quad \text{ب)}$$



$$\overline{AH} = \overline{BH} \cdot \overline{CH}$$

$$\sqrt{r} \cdot \sin 40^\circ$$

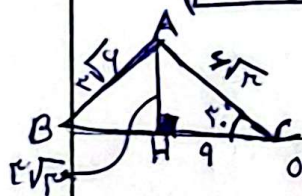
$$\sqrt{r} \cdot \cos 40^\circ$$

$$\boxed{\overline{CH} \tan 40^\circ = r\sqrt{r}}$$

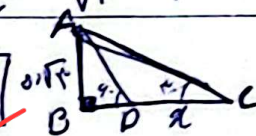
$$\overline{AH} = \overline{BH} \cdot \overline{CH}$$

$$\sqrt{r} \cdot \overline{CH} = \boxed{\overline{CH} = \sqrt{r}}$$

$$\sin B = \frac{\overline{AC}}{\overline{BC}} = \frac{1}{\sqrt{r}} = \frac{\sqrt{r}}{r} \Rightarrow \boxed{B = 40^\circ}$$



$$\kappa = \overline{DC} = \overline{BC} - \overline{BD} = 10 - 0 = \boxed{10 = r}$$



$$\overline{AC} = \overline{AB} \cdot \sin 40^\circ = r = \overline{AC} \Rightarrow \boxed{\overline{AC} = r}$$

$$\overline{BC} = \sqrt{\overline{AC}^2 + \overline{AB}^2} = \sqrt{r^2 + r^2} = \sqrt{2}r = \overline{BC}$$

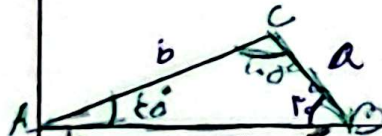
$$\sin \alpha = \frac{\overline{DB}}{\overline{DC}} = \frac{1}{\sqrt{r}}$$



$$\sin 100^\circ = \sin (90 + 10) = \cos (10) = \cos (40 - 30) = \cos 40^\circ \cos 30^\circ + \sin 40^\circ \sin 30^\circ$$

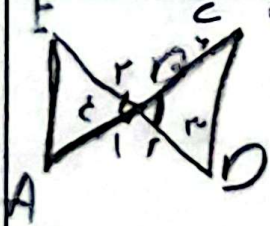
$$\frac{\overline{AB}}{\overline{AC}} = \frac{r}{b} = \frac{\sqrt{r} + \sqrt{r}}{r} = \boxed{\frac{\sqrt{r} + \sqrt{r}}{r} = \frac{\sqrt{r} + 1}{\sqrt{r}}}$$

$$\frac{\sqrt{r}}{\sqrt{r} + \sqrt{r}} = \frac{1}{2} \Rightarrow \boxed{\frac{1}{2} = \frac{\sqrt{r} + 1}{\sqrt{r}}}$$



$$\frac{\overline{AB}}{\sin B} = \frac{\overline{AC}}{\sin C} = \frac{b}{\frac{1}{r}} = \frac{c}{\frac{\sqrt{r} + 1}{\sqrt{r}}} \Rightarrow \frac{c}{b} = \frac{\sqrt{r} + 1}{\frac{1}{r}}$$

$$\frac{\overline{BE}}{\overline{DB}} = \frac{\overline{AB}}{\overline{BC}} \Rightarrow \triangle AEB \cong \triangle CED$$



$$\frac{\overline{AE}}{\overline{BE}} = \left(\frac{\overline{AB}}{\overline{BC}}\right)^r = \boxed{\frac{1}{r \cdot 10}} \quad \text{د)}$$

$$J = \frac{1}{r} ab \sin \alpha = \frac{r \times r \times \frac{\sqrt{r}}{r}}{r} = \boxed{\frac{\sqrt{r}}{r}} \quad \text{الف}$$

$$J = \frac{1}{r} ab \sin \alpha = \frac{r \times r \times \frac{\sqrt{r}}{r}}{r} = \boxed{r\sqrt{r}} \quad \text{ب}$$

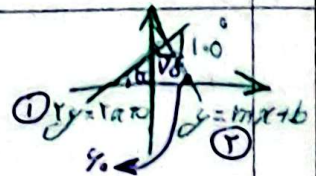
$$a_{PD} = \frac{\Delta y}{\Delta x} = \frac{r - r}{r - (1)} = \frac{r}{r} = 1 = PQ \text{ شیب} = \frac{\sin \alpha}{\cos \alpha} = \tan \alpha$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{1}{r} \Rightarrow r \sin \alpha = \cos \alpha \Rightarrow \sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow \sin^2 \alpha + \frac{1}{r^2} = 1$$

$$\Delta \sin \alpha = 1 \Rightarrow \sin \alpha = \frac{1}{\Delta} \Rightarrow \sin \alpha = \pm \frac{\sqrt{\Delta}}{\Delta} \quad \cos \alpha = \pm \frac{\sqrt{\Delta}}{\Delta}$$

$$r_y = r \sin \theta \Rightarrow y = r \sin \theta \Rightarrow a = 1 = \tan \theta \Rightarrow \theta = 45^\circ$$

$$\tan \theta = -\sqrt{r} = m$$



$$\frac{\Delta}{r} = -\sqrt{r}(\cdot) + b \rightarrow b = \frac{\Delta}{r}$$

$$mb = \frac{\Delta}{r} \times (-\sqrt{r}) = \frac{-\Delta\sqrt{r}}{r}$$

از آنجایی که شیب خط تاثرات ناخواسته که خط را به سمت راست می‌برد را می‌خواهیم، پس $\theta = 45^\circ$

$$f\left(\frac{\Delta\pi}{r}\right) = \cos\left(\pi + \frac{\Delta\pi}{r}\right) + \sin\left(\frac{\pi}{r} - \frac{\Delta\pi}{r}\right) - \tan\left(\frac{\pi}{r} + \frac{\Delta\pi}{r}\right)$$

$$-\cos\left(\frac{\Delta\pi}{r}\right) + \cos\frac{\Delta\pi}{r} + \cot\frac{\Delta\pi}{r} = \boxed{\cot\frac{\Delta\pi}{r}} = \frac{\sqrt{r}}{r}$$

$$\frac{1}{\sqrt{r}}$$

$$\frac{\sin\left(\frac{\Delta\pi}{r} + x\right) + \cos\left(\frac{\Delta\pi}{r} - x\right)}{\cos\left(\frac{\Delta\pi}{r} + x\right) + \sin\left(\frac{\Delta\pi}{r} - x\right)} = \frac{\sin\left(\frac{\Delta\pi}{r} + x\right) + \cos\left(\frac{\Delta\pi}{r} - x\right)}{\cos\left(\frac{\Delta\pi}{r} + x\right) + \sin\left(\frac{\Delta\pi}{r} - x\right)}$$

$$\frac{\cos x - \sin x}{\sin x - \cos x} = \frac{\cos x - \sin x}{\sin x - \cos x} = -1$$

$$\frac{\cos x - \sin x}{\sin x - \cos x} = \boxed{-1}$$