



الف) $4 \times 30 + 4 \times 4 + (30 - \frac{54}{4}) = 20.7$
 $340 - 20.7 = 153$

ب) $|5/5 \times 54 - 30 \times 3| = 20.7$ $340 - 20.7 = 153$

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الف) $2 \times 30 + 2 \times 4 + \frac{14}{4} = 11$

ب) $|15/5 \times 14 - 30 \times 4| = 11$

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الف) $2 \times 3 + \frac{\pi}{4} = 4 + \frac{\pi}{4}$

ب) $4 \times 2 = \frac{\pi}{4} \times 3 = \frac{\pi}{4}$

(ب)

الف) $\frac{a}{r} \times \frac{\pi}{4} \times 9 = \frac{\pi}{4}$

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الف) $BC = \sqrt{10^2 + 12^2 - 2 \times 10 \times 12 \times \cos 40} = \sqrt{19 - 10 \times \frac{1}{4}} = \sqrt{19.75}$ (ب) $\frac{1}{4} \times 10 \times 12 \sin 40 = 20 \times \frac{\sqrt{3}}{4} = 10\sqrt{3}$
 $10\sqrt{3} = 10 + 12 + V = 10$

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$B + C = 150^\circ \Rightarrow A = 30^\circ$ $\frac{10}{\frac{1}{4}} = \frac{10\sqrt{3}}{\sin B} \Rightarrow \sin B = \frac{\sqrt{3}}{4} \Rightarrow B = 45^\circ \Rightarrow C = 105^\circ$
 $105^\circ \Rightarrow 180^\circ - 105^\circ = 75^\circ$

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$B = 45^\circ = \frac{\pi}{4}$ $C = 105^\circ \Rightarrow \frac{10\sqrt{3}}{10} = \frac{R \sin C}{\sin B} \Rightarrow R \sin C = \frac{\sqrt{3}}{4} = C$

$\frac{\tan(\pi - a) + r \tan(\pi + a)}{\tan(r\pi - a) - \tan(r\pi + a)} = \frac{-\tan a + r \tan a}{-\tan a - \tan a} = \frac{r \tan a}{-r \tan a} = -1$

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$\frac{r \tan 10^\circ + \tan 10^\circ}{r \tan 140^\circ - \tan 140^\circ} = \frac{r \tan(90-10) + \tan(90+10)}{r \tan(180-10) + \tan(180+10)} = \frac{r \cot 10 - \cot 10}{-r \tan 10 - \cot 10} = \frac{\frac{r}{a} - \frac{1}{a}}{-ra - \frac{1}{a}}$

$10^\circ = \frac{\pi}{18}$

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$\Rightarrow \frac{\frac{1}{a}}{-ra - \frac{1}{a}} = -\frac{1}{ra + 1}$

$\frac{\sin x + \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} = r \Rightarrow \frac{r}{\sin^2 x - \cos^2 x} \Rightarrow \frac{r}{r \sin^2 x - 1} = r$

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$4 \sin^2 x = 2 \Rightarrow 4 \sin^2 x = 2 \Rightarrow \sin^2 x = \frac{1}{2} \Rightarrow \cos^2 x = \frac{1}{2} \Rightarrow \tan^2 x = \frac{1}{1} = 1$

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

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الف) $\cos(2\pi/15)$ $\cos^2 \pi/15 = \frac{1 + \cos 2\pi/15}{2} = \frac{1 + \frac{\sqrt{3}}{2}}{2} = \frac{2 + \sqrt{3}}{4} \Rightarrow \cos 2\pi/15 = \frac{\sqrt{2 + \sqrt{3}}}{2}$

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ب) $\sin(4\pi/15)$ $\sin^2 4\pi/15 = \frac{1 - \cos 8\pi/15}{2} = \frac{1 - \frac{\sqrt{3}}{2}}{2} = \frac{2 - \sqrt{3}}{4} \Rightarrow \sin 4\pi/15 = \frac{\sqrt{2 - \sqrt{3}}}{2}$