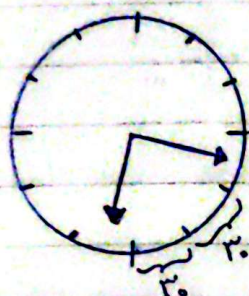


$$4 \times 30 + 4 \times 4 + \left(30 - \frac{54}{r}\right) = 2.7 \quad (1)$$

$$360 - 2.7 = \boxed{153} \quad \checkmark \quad \text{الف (2)}$$

$$15.5 \times 54 - 30 \times 31 = 2.7$$

$$360 - 2.7 = \boxed{153} \quad \checkmark \quad \text{ب (2)}$$



$$2 \times 30 + 2 \times 4 + \frac{18}{r} = \boxed{11} \quad \checkmark \quad \text{الف (2)}$$

$$15.5 \times 18 - 30 \times 11 = \boxed{11} \quad \checkmark \quad \text{ب (2)}$$

$$ar = \frac{M}{r} \times r = \frac{M}{r}$$

$$\text{الف (2)} \quad \frac{a}{r} r^2 = \frac{M}{r} \times r^2 = \boxed{\frac{3M}{r}} \quad \checkmark$$

$$\text{ب (2)} \quad \text{مساحة كل نقطة} = 2 \times r + \frac{M}{r} = 7 + \frac{M}{r} \quad \checkmark$$

$$\frac{1}{r} \times 5 \times 1 \times \sin 60^\circ = 2.0 \times \frac{\sqrt{3}}{r} = \boxed{1.0\sqrt{3}} \quad \checkmark \quad \text{الف (2)} \quad (3)$$

$$BC = \sqrt{5^2 + 1^2 - 2 \times 5 \times 1 \cos 60^\circ} = \sqrt{19 - 10 \times \frac{1}{2}} = \sqrt{14} = \sqrt{49} = 7 \quad \checkmark \quad \text{ب (2)}$$

$$\text{مساحة: } 5 + 7 + 1 = \boxed{13} \quad \checkmark$$

$$\hat{B} + \hat{C} = 150^\circ \Rightarrow \hat{A} = 30^\circ \quad \frac{15}{\frac{1}{r}} = \frac{15\sqrt{r}}{\sin B} \Rightarrow \sin B = \frac{\sqrt{r}}{r} \quad (4) \quad \text{الف (2)}$$

$$\sin B = \frac{\sqrt{r}}{r} \Rightarrow B = \begin{cases} 60^\circ \checkmark \\ 120^\circ \times \Rightarrow \text{حادة } B \end{cases} \quad \hat{B} + \hat{C} = 150^\circ \Rightarrow \hat{C} = 105^\circ$$

$$\hat{B} = 60^\circ = \frac{M}{r} \quad C = 105^\circ \Rightarrow \frac{105}{\frac{1}{r}} = \frac{105r}{r} = \text{Rad} \Rightarrow \text{Rad} = \boxed{\frac{VM}{r}} = \hat{C} \quad \checkmark$$



$$\frac{\tan(M-a) + r \tan(M+a)}{\tan(M-a) - \tan(M+a)} \Rightarrow \frac{-\tan a + r \tan a}{-\tan a - \tan a} = \boxed{\frac{r \tan a}{-r \tan a} = -1} \quad (r) \quad (1)$$

$$\frac{M}{17} = 15^\circ$$

$$A = \frac{r \tan 15^\circ + \tan 10^\circ}{r \tan 17^\circ - \tan 15^\circ} = \frac{r \tan(9^\circ - 15^\circ) + \tan(9^\circ + 15^\circ)}{r \tan(17^\circ - 15^\circ) - \tan(17^\circ + 15^\circ)} \quad (r) \quad (2)$$

$$\Rightarrow A = \frac{r \cot 15^\circ - \cot 15^\circ}{-r \tan 15^\circ - \cot 15^\circ} = \frac{r \times \frac{1}{a} - \frac{1}{a}}{-ra - \frac{1}{a}} = \frac{\frac{1}{a}}{\frac{-ra^2 - 1}{a}} = \frac{1}{-ra^2 - 1} = \boxed{\frac{1}{ra^2 + 1}} \quad (r) \quad (3)$$

(A)

$$\frac{\sin x + \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} \xrightarrow{\text{تقسيم صورتين بـ } \cos x} \frac{\tan x + 1}{\tan x - 1} + \frac{\tan x - 1}{\tan x + 1} \quad (r) \quad (4)$$

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

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

$$r \tan^2 x - r = r \tan^2 x + r \Rightarrow \boxed{\tan^2 x = 0} \quad (r) \quad (5)$$

$$\frac{\sin^2 x - r \cos^2 x + 1}{\sin^2 x + r \cos^2 x - 1} = r \Rightarrow \frac{\sin^2 x - r + r \sin^2 x + 1}{\sin^2 x + r - r \sin^2 x - 1} = \frac{r \sin^2 x - 1}{1 - \sin^2 x} = r \quad (r) \quad (6)$$

$$\Rightarrow r - r \sin^2 x = r \sin^2 x - 1 \Rightarrow 0 = 2 \sin^2 x \Rightarrow \sin^2 x = \frac{0}{2}$$

$$1 + \cot^2 x = \frac{1}{\frac{0}{2}} = \frac{2}{0} \Rightarrow \cot^2 x = \frac{r}{0} \Rightarrow \boxed{\tan^2 x = \frac{0}{r}} \quad (r) \quad (7)$$



$$\cos(2\psi/\omega) \Rightarrow \cos^2 2\psi/\omega = \frac{1 + \cos 4\psi/\omega}{2} = \frac{1 + \frac{\sqrt{r}}{r}}{2} = \frac{r + \sqrt{r}}{2r} = \frac{r + \sqrt{r}}{2r} \quad (10) \text{ الف}$$

$$\Rightarrow \cos^2 2\psi/\omega = \frac{1 + \sqrt{r}}{2} \Rightarrow \cos 2\psi/\omega < \begin{matrix} -\frac{\sqrt{r} + \sqrt{r}}{2} \times \\ \boxed{\frac{\sqrt{r} + \sqrt{r}}{2}} \checkmark \end{matrix} \quad (1, \sqrt{r})$$

$$\sin(4\psi/\omega) \Rightarrow \sin^2 4\psi/\omega = \frac{1 - \cos 8\psi/\omega}{2} = \frac{1 + \frac{\sqrt{r}}{r}}{2} = \frac{r - \sqrt{r}}{2r} \quad (ب)$$

$$\Rightarrow \sin^2 4\psi/\omega = \frac{r - \sqrt{r}}{2} \Rightarrow \sin 4\psi/\omega < \begin{matrix} -\frac{\sqrt{r} - \sqrt{r}}{2} \times \\ \boxed{\frac{\sqrt{r} + \sqrt{r}}{2}} \checkmark \end{matrix}$$