

$$y = k^r \Rightarrow k=1 \rightarrow y=1$$

$$y = k^r \Rightarrow k=3 \rightarrow y=9$$

$$\Rightarrow \begin{cases} 3^{A+B} = 1 & A+B=0 \\ 3^{2A+B} = 9 & 2A+B=2 \end{cases} \Rightarrow A=-1, B=1 \rightarrow f(x) = 3^{x-1} \Rightarrow 3^{-1} = \frac{1}{3}$$

(۲)

$$g_{r, \omega}^{k^x + 1} = x + \omega \Rightarrow r^x + \omega = r^{x+\omega} \Rightarrow (r^x)^r + \omega = \omega r^x \xrightarrow{r=x} r^r + \omega = \omega r \xrightarrow{r=\omega} r^r + \omega = \omega r$$

$$\rightarrow r^r = \omega \rightarrow x = g_{r, \omega}^r$$

$$\rightarrow r^r = \omega \rightarrow x = g_{r, \omega}^{\omega} \rightarrow g_{r, \omega}^r + g_{r, \omega}^{\omega} = g_{r, \omega}^{\omega}$$

(۲)

$$(g_{r, r}^r)^r + (1 + g_{r, r}^r)(r + g_{r, r}^r) = (g_{r, r}^r)^r + r + g_{r, r}^r + g_{r, r}^r + g_{r, r}^r + g_{r, r}^r g_{r, r}^r$$

$$\rightarrow g_{r, r}^r \times 1 + r + 1 + g_{r, r}^r = \boxed{E}$$

(۲)

$$g_{r, r}^{(1-k)^r} + r g_{r, r}^{1-k} = r g_{r, r}^{1-k} + r g_{r, r}^{1-k} = \omega g_{r, r}^{1-k} = \omega \Rightarrow g_{r, r}^{1-k} = 1 \Rightarrow 1-k=10 \Rightarrow k=-9$$

$$\rightarrow g_{r, r}^9 = \boxed{r}$$

(۲)

$$g_{r, r}^{(x+r)(k^r + 2k + E)} = r \Rightarrow g_{r, r}^{k^r - 1} = r \rightarrow k^r - 1 = 1 \rightarrow k^r = 14 \rightarrow k = \sqrt[3]{14}$$

$$g_{r, r}^{\sqrt[3]{14}} = \boxed{E}$$

(۲)

$$g_{(r-k)(k-r)^r} = g_{\frac{r-k}{k-r}} = r \rightarrow \left( \frac{r-k}{k-r} \right)^r = 10^r \rightarrow \frac{r-k}{k-r} = 10 \rightarrow k = -1 \rightarrow g_{\frac{r}{r}} = 4 \quad \checkmark$$

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$$k^r = r^r \rightarrow k^r - r^r = 0 \rightarrow k = r + \sqrt{r^r} \rightarrow g_{\frac{r}{r}} = \frac{1}{r} \quad \checkmark$$

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$$g_{\frac{r}{r}} = \frac{g_r^r}{g_r^r} \rightarrow g_r^r = r \rightarrow g_r^r = g_r^r + g_r^r = 1 + r g_r^r \xrightarrow{g_r^r = \frac{r}{1+r}} g_r^r = \frac{r}{1+r} = \frac{1}{2} \quad \checkmark$$

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$$g_{\frac{r}{r}} = \frac{g_r^r}{g_r^r} \Rightarrow g_r^r = g_r^r + g_r^r = \frac{1}{r} + r = 1 + r \rightarrow g_{\frac{r}{r}} = \frac{1}{1+r} = \frac{1}{2} \quad \checkmark$$

(2)

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$$k = -1 \xrightarrow{a+c=b} a g_r + b g_r = a \rightarrow b g_r = a - a g_r \Rightarrow b g_r = a(1 - g_r) \Rightarrow \frac{b}{a} = \frac{1 - g_r}{g_r}$$

$$\frac{g_r - g_r}{g_r} = \frac{g_r^b}{g_r^a} = g_r^{\frac{b}{a}} = (\sqrt{r})^{\frac{b}{a}} = r^{\frac{b}{2a}} = a^{\frac{1}{r}} = \sqrt{a} \quad \checkmark$$

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