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$$(1! + 3! + 5! + \dots + 25!) \rightarrow 1 + 6 = 7$$

(۲)

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به بعد چون ملاحظه شود
یکان صفری شود

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حاصل شده

$$(1! + 3! + 5! + \dots + 25!) \rightarrow 4 + 2 = 6$$

= (۲) ✓

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$$\sqrt[3]{(4+\sqrt{5})^{-1}} \sqrt{1+\sqrt{5}} = \sqrt[3]{(4+\sqrt{5})^{-1}} \sqrt{(1+\sqrt{5})^2}$$

10

$$= \sqrt[3]{\frac{1+2\sqrt{5}}{4+\sqrt{5}}} = \sqrt[3]{\frac{1(4+\sqrt{5})}{4+\sqrt{5}}} = \sqrt[3]{1} \quad \checkmark$$

(۲)

$$\left(\frac{\sqrt{2}+\sqrt{5}}{\sqrt{2}\sqrt{5}+\sqrt{5}} \right) \left(\sqrt{2}-\sqrt{5} \right) - \sqrt{2}+\sqrt{5}$$

$$= \left(\frac{\sqrt{2}}{2} \right) (\sqrt{2}-\sqrt{5}) - \sqrt{2}+\sqrt{5} = \frac{\sqrt{2}-2\sqrt{5}}{2} - \frac{\sqrt{2}+\sqrt{5}}{2} = \frac{\sqrt{2}-1\sqrt{5}-\sqrt{2}-\sqrt{5}}{2}$$

15

$$= \frac{\sqrt{2}-1\sqrt{5}-\sqrt{2}-\sqrt{5}}{2} = \frac{-2\sqrt{5}}{2} = -\sqrt{5} \quad \checkmark$$

۳)

$$\sqrt{8} + \sqrt{2} = 2(\sqrt{2} - 1)^{-1}$$

(۲)

$$\frac{(\sqrt{2}+\sqrt{2})(\sqrt{2}-\sqrt{2})}{2-\sqrt{2}} = \frac{2}{\sqrt{2}-1} = \sqrt{2}+\sqrt{2} - \frac{2}{\sqrt{2}-1}$$

$$\frac{1}{\sqrt{2}-1} + \frac{\sqrt{2}+1}{\sqrt{2}+1} = \sqrt{2}+1 - \frac{2}{\sqrt{2}-1} = \sqrt{2}+\sqrt{2}-\sqrt{2}-1 = \sqrt{2}-1 \quad \checkmark$$

25

$$\frac{\sqrt{2\sqrt{2}-1}}{2+\sqrt{2}} + (2-\sqrt{2})^{-1}$$

$$\frac{(\sqrt{2}-1)(2+\sqrt{2})}{2+\sqrt{2}} + \frac{1}{2-\sqrt{2}} = \sqrt{2}-1 + \frac{1}{2-\sqrt{2}}$$

$$= \frac{(\sqrt{2}-1)(2+\sqrt{2})+1}{2-\sqrt{2}} \times \frac{2+\sqrt{2}}{2+\sqrt{2}} = \frac{2\sqrt{2}-1+2+\sqrt{2}}{2-\sqrt{2}} = \frac{3\sqrt{2}+1}{2-\sqrt{2}} \quad \boxed{2\sqrt{2}+1}$$

$$\frac{\sqrt{1+\sqrt{2}} + \sqrt{\sqrt{2}-1}}{\sqrt{\sqrt{2}-\sqrt{2}}}$$

(2)

$$A = \sqrt{1+\sqrt{2}} + \sqrt{\sqrt{2}-1} \quad \text{إذن} \quad \sqrt{2}+1 + \sqrt{2}-1 + 2\sqrt{(2+1)(2-1)} \\ = 2\sqrt{2} + 2\sqrt{2} = 2\sqrt{2} + 2\sqrt{2} = 2\sqrt{2} + 2\sqrt{2} = 4\sqrt{2} = A^2 \\ \Rightarrow A = \sqrt{4\sqrt{2}}$$

$$\rightarrow \frac{\sqrt{2(2+\sqrt{2})}}{\sqrt{\sqrt{2}-\sqrt{2}}} = \sqrt{\frac{2(2+\sqrt{2})}{\sqrt{2}-\sqrt{2}}} \times \sqrt{\frac{\sqrt{2}+\sqrt{2}}{\sqrt{2}+\sqrt{2}}} = \sqrt{\frac{2(2+\sqrt{2})}{1}}$$

$$= \sqrt{2(2+\sqrt{2})} = \sqrt{4+2\sqrt{2}} = \sqrt{(\sqrt{2}+1)^2} = \sqrt{2}+1$$

$$\rightarrow \frac{\sqrt{1+\sqrt{2}} + \sqrt{\sqrt{2}-1}}{2-\sqrt{2}} - 2 = \sqrt{2} + 2 - 2 = \sqrt{2} \quad \boxed{\sqrt{2}}$$

$$\frac{\sqrt[4]{2^8}}{\sqrt[4]{2^8}} \times \sqrt[4]{16} \times \sqrt[4]{2} =$$

$$\sqrt[4]{2^8} \times \sqrt[4]{2^8 \times 2} \times \sqrt[4]{2^{16}} = \sqrt[4]{2^8} \times \sqrt[4]{2^{16}} \times \sqrt[4]{2^{16}} \times \sqrt[4]{2^{16}} \\ = \sqrt[4]{2^{16} \times 2^{16} \times 2^{16} \times 2^{16}} = 2 \times 2^2 = 12 \quad \boxed{12}$$

Q1)

$$r^x (r + r^2 + r^3 + \dots + r^w) = ar$$

$$r^x (r^{-r} + r^{-1} + 1 + r + r^1 + r^2)$$

$$\Rightarrow r^x (10/100) (10r) = r^x (100)$$

$$\frac{r^x}{r^x} = \left(\frac{r}{r}\right)^x = \frac{100}{100}$$

$$\frac{100}{100} = \frac{1}{1} = \left(\frac{r}{r}\right)^x \Rightarrow \boxed{x = 1} \checkmark$$

Q1)

$$(a-b)^2 (a+b)^2 = (a-b)^2 (a+b)^2$$

$$= (a^2 - b^2)^2$$

$$= (\sqrt{a^2 - b^2} - \sqrt{a^2 - b^2})^2$$

~~$$(a-b)^2 (\sqrt{a^2 - b^2} - \sqrt{a^2 - b^2})^2$$~~

$$= (2\sqrt{a^2 - b^2})^2 = 4(a^2 - b^2)$$

$$= 4(2 - \sqrt{2})$$

$$= 4(2 - \sqrt{2})$$

$$\Rightarrow \boxed{t = 14} \checkmark$$

V1)

$$a + \frac{1}{a} = A$$

$$\sqrt{a} = B$$

$$\Rightarrow (A+B)(A-B) = (A^2 - B^2)$$

$$= \left(a + \frac{1}{a}\right) = (\sqrt{a} \cdot \sqrt{a} + \frac{1}{\sqrt{a} \cdot \sqrt{a}})$$

$$v = 2\sqrt{2} = \sqrt{2}(\sqrt{2} - \sqrt{2})$$

$$= (2 - \sqrt{2} + \frac{1}{2 - \sqrt{2}}) = \frac{(2 - \sqrt{2})(2 - \sqrt{2}) + 1}{2 - \sqrt{2}} \times \frac{(2 + \sqrt{2})}{(2 + \sqrt{2})}$$

$$= \left(\frac{2 - \sqrt{2} + 2 + \sqrt{2}}{2 - \sqrt{2}}\right) = (t) = 14 = 8^t \Rightarrow \boxed{t = 8} \checkmark$$

