

$$1 \quad 11 + 31 + 51 + \dots + 251 = 1 + 9 + 17 + \dots + 251 \rightarrow \text{یکان: } 7$$

بدلیل وجود عامل ۵ و یکان ۷ صفر شود

$$3 \quad 21 + 41 + 61 + \dots + 261 = 4 + 24 + 44 + \dots + 261 \rightarrow \text{یکان: } 6$$

$$4 \quad 6 \times 7 = 42$$

$$6 \quad \text{(الف)} \quad \sqrt[4]{(4+\sqrt{7})^{-1}} \sqrt{1+\sqrt{7}} = \sqrt[4]{(4+\sqrt{7})^{-1}} \times \sqrt{(1+\sqrt{7})^2} = \sqrt{\frac{1+\sqrt{7}+2\sqrt{7}}{4+\sqrt{7}}} \quad (2)$$

$$= \sqrt[4]{2}$$

$$8 \quad \text{(ب)} \quad \left(\frac{\sqrt{2}+\sqrt{5}}{\sqrt{10}+2} \right) (\sqrt{3}-\sqrt{5} - \sqrt{3+\sqrt{5}}) = \frac{\sqrt{2}}{2} \times -\sqrt{2} = -1$$

$$10 \quad \frac{\sqrt{2}+\sqrt{5}}{\sqrt{10}+2} \times \frac{\sqrt{10}-2}{\sqrt{10}-2} = \frac{\sqrt{20}-\sqrt{10}+\sqrt{50}-2\sqrt{2}}{10-4} = \frac{3\sqrt{2}}{6} = \frac{\sqrt{2}}{2}$$

$$12 \quad \sqrt{3}-\sqrt{5} - \sqrt{3+\sqrt{5}} = x \rightarrow (\sqrt{3}-\sqrt{5} - \sqrt{3+\sqrt{5}})^2 = x^2$$

$$13 \quad \rightarrow 3-\sqrt{5} + 3+\sqrt{5} - 2\sqrt{3^2-\sqrt{5}} = x^2 \quad x^2 = 2$$

$$14 \quad x \in \left(\frac{+\sqrt{2}}{-\sqrt{2}} \right) \times \rightarrow |\sqrt{3}-\sqrt{5} - \sqrt{3+\sqrt{5}}| < 0$$

$$16 \quad \text{(الف)} \quad \frac{\sqrt{1}+\sqrt{27}}{5-\sqrt{6}} - 2(\sqrt[4]{9}-1)^{-1} = \sqrt{3}+\sqrt{2} - \sqrt{3}-1 = \sqrt{2}-1 \quad (3)$$

$$17 \quad \frac{\sqrt{1}+\sqrt{27}}{5-\sqrt{6}} = \frac{2\sqrt{2}+3\sqrt{3}}{5-\sqrt{6}} \times \frac{5+\sqrt{6}}{5+\sqrt{6}} = \frac{10\sqrt{2}+15\sqrt{3}+2\sqrt{12}+3\sqrt{18}}{25-6}$$

$$19 \quad = \frac{14\sqrt{2}+19\sqrt{3}}{19} = \sqrt{2}+\sqrt{3} \quad -2(\sqrt[4]{9}-1)^{-1} = -2 \times \frac{1}{\sqrt{3}-1} = \frac{-2}{\sqrt{3}-1}$$

$$20 \quad \frac{-2}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{-2\sqrt{3}-2}{2} = -\sqrt{3}-1$$

$$1 \rightarrow r^x = r^{x-r} \times r^r \rightarrow r^{x-r} = r^{x-r} \rightarrow x=r$$

$$2 \quad (a-b)^r \times (a+b)^r = t(r\sqrt{r})$$

$$3 \rightarrow (a-b)^r \times (a+b)^r = t(r\sqrt{r})$$

$$4 \rightarrow (a-b) \times (a+b)^r = t(r\sqrt{r}) \rightarrow (a^r - b^r)^r = t(r\sqrt{r})$$

$$5 \rightarrow (\sqrt{\sqrt{r}-r} - \sqrt{\sqrt{r}+r})^r = t(r\sqrt{r}) = (\sqrt{r-1} + \sqrt{r+1} - r\sqrt{r})$$

$$6 \rightarrow (r\sqrt{r} - r\sqrt{r})^r = t(r\sqrt{r}) \rightarrow r^{r+1} - r(r\sqrt{r})$$

$$7 = r^2 - 1 \times \sqrt{r} = t(r\sqrt{r}) \rightarrow t = 1 \times$$

$$\left(\left(a + \frac{1}{a} + \sqrt{r} \right) \left(a + \frac{1}{a} - \sqrt{r} \right) \right)^{\frac{r}{2}} = r^{\frac{1}{2}} \rightarrow \left(a + \frac{1}{a} \right)^{\frac{r}{2}} r = r^{\frac{1}{2}} \quad \checkmark$$

$$\rightarrow a^{\frac{r}{2}} + \frac{1}{a^{\frac{r}{2}}} + \cancel{r} - \cancel{r} = r^{\frac{1}{2}} = a^{\frac{r}{2}} + \frac{1}{a^{\frac{r}{2}}} = r^{\frac{1}{2}} \rightarrow \frac{\left(\sqrt{r} - r\sqrt{r} \right)^{\frac{r}{2}}}{\left(r\sqrt{r} - r\sqrt{r} \right)^{\frac{r}{2}}}$$

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

$$\rightarrow r - \sqrt{r} + \frac{1}{r - \sqrt{r}} = r^{\frac{1}{2}} \rightarrow \frac{r - r\sqrt{r} + 1}{r - \sqrt{r}} = r^{\frac{1}{2}}$$

PARAMOUNT

$$\rightarrow \frac{r - r\sqrt{r}}{r - \sqrt{r}} = r^{\frac{1}{2}} \rightarrow r^{\frac{1}{2}} = r \rightarrow \frac{1}{r} = 1 \rightarrow \boxed{r = 1}$$

$$A = \sqrt{r} \sqrt{1/r} \left(\frac{1}{r}\right)^{-\frac{r}{2}} = \sqrt{r} \times r^{\frac{r}{2}} = r^{\frac{r}{2}} \times r^{\frac{r}{2}} = r^r = \beta \quad \textcircled{1}$$

$$(YA)^{-\frac{1}{r}} = (r \times r^r)^{-\frac{1}{r}} = (r^r)^{-\frac{1}{r}} = r^{-1} = \frac{1}{r}$$

$$\sqrt{a} = r \sqrt{a}^{\frac{1}{r}} \Rightarrow a^{\frac{1}{r}} = r \times a^{\frac{1}{r}} \Rightarrow a = r^r a^{\frac{r}{r}} \quad \textcircled{9}$$

$$\Rightarrow 1 = r^r + a^{\frac{r}{r}} \Rightarrow a^{\frac{r}{r}} = r^{-r} \Rightarrow a^r = r^{-r}$$

$$\Rightarrow a^r = \frac{1}{r^r} \Rightarrow a = \pm \frac{1}{r^{\frac{r}{r}}} \xrightarrow{a > 0} a = \frac{1}{r^r}$$

$$\frac{\frac{1}{a} - r}{1 + \sqrt{r}} = \frac{r\sqrt{r} - r}{\sqrt{r} + 1} \times \frac{\sqrt{r} - 1}{\sqrt{r} - 1} = \frac{r - r\sqrt{r} - r\sqrt{r} + r}{r} = \frac{r - 2r\sqrt{r}}{r} = 1 - 2\sqrt{r} \quad \textcircled{10}$$

$$\sqrt{x+a} - \sqrt{x-r} = r$$

$$(\sqrt{x+a} - \sqrt{x-r}) (\sqrt{x+a} + \sqrt{x-r}) = x+a + (x-r) = a+r$$

$$\frac{a+r}{r} \Rightarrow \sqrt{x+a} + \sqrt{x-r}$$

$$\frac{a}{r} + r - r = \frac{a}{r}$$