

$$(11 + 31 + 51 + \dots + 251) (21 + 41 + 61 + \dots + 241)$$

$$1 + 4 + 16 + \dots + 251 \quad 2 + 12 + 18 + \dots + 241$$

۱- $2 = 4 - 1$ پس یگان عبارت ۲ است.
 ۲- $7 = 4 + 3$ پس یگان عبارت ۲ و ۵ یگان نشان صفر است.
 ۳- $1 + 4 = 5$ پس یگان عبارت ۱ و ۴ یگان نشان صفر است.
 ۴- $2 + 4 = 6$ پس یگان عبارت ۲ و ۴ یگان نشان صفر است.
 ۵- $1 + 4 = 5$ پس یگان عبارت ۱ و ۴ یگان نشان صفر است.

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

$$\sqrt[4]{(1 + \sqrt{7})^2} = \sqrt[4]{1 + 2\sqrt{7}}$$

$$(ب) \left(\frac{\sqrt{2} + \sqrt{5}}{\sqrt{10} + 2} \right) (\sqrt{3} - \sqrt{5} - \sqrt{3 + \sqrt{5}}) = \frac{\sqrt{2}}{2} (\sqrt{3} - \sqrt{5} - \sqrt{3 + \sqrt{5}})$$

$$\sqrt{2} + \sqrt{5} = \sqrt{2}$$

$$\sqrt{2}(\sqrt{5} + \sqrt{2}) = 2$$

$$\sqrt{1} = 1 \leftarrow \frac{2}{4} (3 - \sqrt{5} + 3 + \sqrt{5} - 2\sqrt{9 - 5}) = \frac{2}{4} \times 2 = 1$$

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

$$(الف) \frac{\sqrt{18} + \sqrt{27}}{5 - \sqrt{6}} - 2(\sqrt{9} - 1)^{-1} \rightarrow 2\left(\frac{1}{\sqrt{3} - 1}\right)$$

$$\frac{2\sqrt{2} + 3\sqrt{3}}{5 - \sqrt{6}} \times \frac{5 + \sqrt{6}}{5 + \sqrt{6}} = \frac{10\sqrt{2} + 15\sqrt{3} + 9\sqrt{2} + 6\sqrt{3}}{25 - 6} = \frac{19(\sqrt{2} + \sqrt{3})}{19} = \sqrt{2} + \sqrt{3}$$

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

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

$$(ب) \frac{\sqrt{27} - 1}{4 + \sqrt{3}} + (2 - \sqrt{3})^{-1} \rightarrow \frac{1}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}} = \frac{2 + \sqrt{3}}{4 - 3} = 2 + \sqrt{3}$$

$$\frac{3\sqrt{3} - 1}{4 + \sqrt{3}} \times \frac{4 - \sqrt{3}}{4 - \sqrt{3}} = \frac{12\sqrt{3} - 4 - 3 + \sqrt{3}}{16 - 3} = \frac{13(\sqrt{3} - 1)}{13} = \sqrt{3} - 1$$

$$\sqrt{3} - 1 + 2 + \sqrt{3} = 2\sqrt{3} + 1$$

$$(الف) \sqrt{1 + \sqrt{3}} + \sqrt{3} - 1 - 2 = 2 + \sqrt{6} - 2 = \sqrt{6}$$

$$\sqrt{3} - \sqrt{2} \rightarrow \frac{1 + \sqrt{3} + \sqrt{3} - 1 + 2\sqrt{3} - 1}{\sqrt{3} - \sqrt{2}} = \frac{2\sqrt{3} + 2\sqrt{3}}{\sqrt{3} - \sqrt{2}}$$

$$\Rightarrow \frac{2\sqrt{3} + 2\sqrt{3}}{\sqrt{3} - \sqrt{2}} \times \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}} = \frac{4 + 4\sqrt{6}}{3 - 2} = 10 + 4\sqrt{6} \rightarrow \sqrt{10 + 4\sqrt{6}} = 2 + \sqrt{6}$$

$$\sqrt[n]{\sqrt[n]{r^1}} \times \sqrt[n]{\sqrt[n]{14r}} \times \sqrt[n]{\sqrt[n]{r^9}} = \sqrt[n]{r^1} \times \sqrt[n]{r^{14}} \times \sqrt[n]{r^9} = \sqrt[n]{r^{1+14+9}} = \sqrt[n]{r^{24}} = r \times r = 14$$

$\downarrow \quad \quad \quad \downarrow \quad \quad \quad \downarrow$
 $\sqrt[n]{r^1} = \sqrt[n]{r^1} \quad \quad \quad \sqrt[n]{r^{14}} \quad \quad \quad \sqrt[n]{r^9}$

$$\frac{r^{n+1} + r^{n+2} + r^{n+3} + r^{n+4} + r^{n+5}}{r^{n-1} + r^{n-2} + r^{n-3} + r^{n-4} + r^{n-5}} = \Delta r \Rightarrow \frac{r^n (1 + r + r^2 + r^3 + r^4 + r^5)}{r^n (\frac{1}{r} + \frac{1}{r^2} + \frac{1}{r^3} + \frac{1}{r^4} + \frac{1}{r^5})} = \Delta r$$

$$\Rightarrow \frac{r^x}{r^n} \left(\frac{r^4 r^5}{r^9} \right) = \Delta r \Rightarrow \frac{r^n}{r^n} \left(\frac{r \times \Delta r}{9} \right) = \Delta r \Rightarrow \frac{r^n}{r^n} \times \frac{r}{9} = 1 \Rightarrow n = 2$$

$$((a^r + b^r - rab)(a^r + b^r + rab))^r = (a^r + b^r + rab - rab)^r = (a^r + b^r - rab)^r$$

$$(a^r + b^r - rab)^r = (a^r + b^r - rab)^r$$

$\downarrow \quad \quad \quad \downarrow \quad \quad \quad \downarrow$
 $\sqrt[r]{a^r} = a \quad \quad \quad \sqrt[r]{b^r} = b \quad \quad \quad \sqrt[r]{rab} = \sqrt[r]{r} \sqrt[r]{ab}$

$$(\sqrt{9-x} + \sqrt{9+x} - r\sqrt{r})^r = (r\sqrt{9-x} - r\sqrt{9+x})^r = r^r + 1 - 1\sqrt{12} = r^r - 14\sqrt{r} = 14(r - \sqrt{r})$$

$+ (r - \sqrt{r}) = 14(r - \sqrt{r}) \Rightarrow t = 14$

$$a = \sqrt[r]{r - r\sqrt{r}} = \sqrt[r]{(r - \sqrt{r})^r} = \sqrt[r]{r - \sqrt{r}}$$

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

$$\left(a^r + \frac{1}{a^r} \right)^r = \left(r - \sqrt{r} + \frac{1}{r - \sqrt{r}} \right)^r = \left(r - \sqrt{r} + \frac{r + \sqrt{r}}{r - \sqrt{r}} \right)^r = r^r = 14$$

$\frac{1}{r - \sqrt{r}} \times \frac{r + \sqrt{r}}{r + \sqrt{r}} = \frac{r + \sqrt{r}}{r - \sqrt{r}} = r + \sqrt{r}$

$$A = \sqrt[r]{r\sqrt{14}} \left(\frac{1}{r} \right)^{-\frac{r}{r}} = \sqrt[r]{r^{10}} \times r^{\frac{r}{r}} = r^{\frac{r}{r}} \times r^{\frac{r}{r}} = r^{\frac{r}{r}} = r$$

$$(rA)^{-\frac{1}{r}} = (1)^{-\frac{1}{r}} = \left(\frac{1}{1} \right)^{\frac{1}{r}} = \left(\frac{1}{r} \right)^{\frac{1}{r}}$$

$$\sqrt[r]{a} = r^{\frac{r}{r}} a^{\frac{10}{r}} \Rightarrow \frac{\sqrt[r]{a}}{\sqrt[r]{a^{10}}} = r^{\frac{r}{r}} \Rightarrow \sqrt[r]{\frac{1}{a^9}} = r^{\frac{r}{r}} \Rightarrow \frac{1}{a^9} = r \Rightarrow a^r = \frac{1}{r^9}$$

$\frac{1}{a^9} = r \Rightarrow \frac{1}{a^9} = r \Rightarrow \frac{1}{a^9} = r \Rightarrow \frac{1}{a^9} = r$

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

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