

رقم یکان؟ $\rightarrow (21 + 41) + 61 + \dots + 241$ $(11 + 31) + 51 + \dots + 251$
 * رقم یکان بعضی فاکتوریل ها به از این ماضی است چون عامل ۲ و ۵ دارند:

$1 + (1 \times 2 \times 3) = 7$
 $(2 \times 1) + (4 \times 3 \times 2 \times 1) = 24$
 $24 \times 7 = 168 \rightarrow \text{رقم یکان} = (7)$

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

$\sqrt[4]{\frac{2(4+\sqrt{5})}{4+\sqrt{5}}} = \sqrt[4]{2}$
 $\rightarrow m < 0 \rightarrow m^2 = 3 \rightarrow 5 + 3 + \sqrt{5} = 2\sqrt{(4-\sqrt{5})(4+\sqrt{5})} = 2$
 $m = -\sqrt{2}$
 ب) $(\frac{\sqrt{2}+\sqrt{5}}{\sqrt{5}+2}) (\frac{\sqrt{3}\sqrt{5}-\sqrt{3}+\sqrt{5}}{\sqrt{2}(\sqrt{5}+2)}) = \frac{\sqrt{2}+\sqrt{5}}{\sqrt{2}(\sqrt{5}+2)} \times (-\sqrt{2}) = \frac{-\sqrt{2}}{\sqrt{2}} = (-1)$

الف) $\frac{\sqrt{11}+\sqrt{27}}{5-\sqrt{4}} - 2(4\sqrt{9}-1)^{-1} =$

$\frac{(\sqrt{11}+\sqrt{27})(5+\sqrt{4})}{(5-\sqrt{4})(5+\sqrt{4})} - \frac{2(\sqrt{3}+1)}{(4-1)(\sqrt{3}+1)} =$
 $\frac{5\sqrt{11} + 5\sqrt{27} + \sqrt{44} + \sqrt{108}}{19} - \sqrt{3} - 1 =$
 $\frac{19(\sqrt{11}+\sqrt{27})}{19} - \sqrt{3} - 1 = (\sqrt{11}+\sqrt{27}) - \sqrt{3} - 1$

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

$\frac{1(2+\sqrt{3})}{2-\sqrt{3}(2+\sqrt{3})} = 2+\sqrt{3}$
 $\frac{(\sqrt{27}-1)(2-\sqrt{3})}{(4+\sqrt{3})(2-\sqrt{3})} = \frac{12\sqrt{3}-9-4+\sqrt{3}}{13} =$
 $\frac{13\sqrt{3}-13}{13} = \sqrt{3}-1$
 جواب = $\sqrt{3}-1 + 2+\sqrt{3} = 1+2\sqrt{3}$

الف) $\frac{\sqrt{1+\sqrt{3}} + \sqrt{\sqrt{3}-1}}{\sqrt{\sqrt{3}-2}} - 2 = \sqrt{4} + 2 - 2 = \sqrt{4} = (2)$

$A^2 = \frac{(1+\sqrt{3}+\sqrt{3}+2\sqrt{2})}{2} = \frac{2(\sqrt{3}+\sqrt{2})(\sqrt{3}+\sqrt{2})}{2} =$
 $A^2 = 2(\sqrt{3}+\sqrt{2})^2 \rightarrow A = \sqrt{2}(\sqrt{3}+\sqrt{2}) = \sqrt{4}+2$

ب) $\sqrt[4]{3\sqrt{11}} \times \sqrt[4]{142} \times \sqrt[4]{9\sqrt{2}} =$

$2^{\frac{1}{4}} \times 3^{\frac{1}{4}} \times 2^{\frac{1}{4}} \times 2^{\frac{1}{4}} \times 2^{\frac{1}{4}} = 2 \times 2 = (4)$

جمع دنباله هندسی = $\frac{3^2-1}{3-1} = \frac{8}{2} = 4$

$\frac{3^n + 3^{n+1} + 3^{n+2} + \dots + 3^{n+5}}{3^{n-2} + 3^{n-1} + 3^n + \dots + 3^{n+3}} = 52$ صورت: $3^n(1+3+3^2+\dots+3^3) = 3^n \times 40$
 مخرج: $3^{n-2}(1+3+3^2+\dots+3^5) = 3^{n-2} \times 43$

$\frac{3^n \times 40}{3^{n-2} \times 43} = \frac{3^n}{3^{n-2}} \times \frac{40}{43} = 52 \rightarrow \frac{3^2}{1} = 9 \rightarrow 3^n = 9 \rightarrow n=2$
 $\frac{3^2}{3^{2-2}} = 9 \rightarrow 3^0 = 1 \rightarrow n=2$

$$(a^r - b^r)^r$$

$$(a^r + b^r - rab)^r (a^r + b^r + rab)^r = t (r - \sqrt{r})$$

$$a = \sqrt[r]{\sqrt{r}-r}$$

$$b = \sqrt[r]{\sqrt{r}+r}$$

$$\frac{(a-b)^r}{(a-b)^r} = \frac{(a+b)^r}{(a+b)^r}$$

$$(\sqrt{\sqrt{r}-r} - \sqrt{\sqrt{r}+r})^r = (\sqrt{r}-r + \sqrt{r}+r - 2\sqrt{r})^r = (2\sqrt{r}-2\sqrt{r})^r = 2^r + 1 - 14\sqrt{r}$$

$$= 2^r - 14\sqrt{r} \rightarrow t(r - \sqrt{r}) = 2^r - 14\sqrt{r} \rightarrow t = 14$$

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

$$a = \sqrt[r]{r - r\sqrt{r}}$$

$$\sqrt{r - r\sqrt{r}} + \frac{1}{\sqrt{r - r\sqrt{r}}} + r = 9 - \sqrt{r} + \frac{\sqrt{r} + r\sqrt{r}}{r - r\sqrt{r}} = 14$$

$$r^t = 14 \rightarrow t = r$$

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

$$\sqrt[r]{r^r \times 14} = \sqrt[r]{r^{10}} = r^{\frac{1}{10}} \quad r^{\frac{r}{10}} = r^r = r$$

$$(rA)^{-\frac{1}{r}} = (r \times r)^{-\frac{1}{r}} = (r^2)^{-\frac{1}{r}} = r^{-1} = \left(\frac{1}{r}\right) \leftarrow ? (rA)^{-\frac{1}{r}} \text{ log}$$

$$a > 0 \rightarrow \sqrt[r]{a} = r \sqrt[r]{a} \rightarrow a^{\frac{1}{r}} = r \sqrt[r]{a} \rightarrow r \sqrt[r]{a} = a^{-\frac{1}{r}} = a^{-r}$$

$$\frac{(\frac{1}{a} - r)}{1 + \sqrt{r}} = \frac{r\sqrt{r} - r}{1 + \sqrt{r}} = \frac{r(\sqrt{r} - 1)}{1 + \sqrt{r}(\sqrt{r} - 1)} = \frac{9 + r - 4\sqrt{r}}{r} = \frac{1}{r\sqrt{r}} \rightarrow a = \frac{1}{r\sqrt{r}}$$

$$\frac{12 - 4\sqrt{r}}{r} = \frac{r(4 - 3\sqrt{r})}{r} = (4 - 3\sqrt{r})$$

$$\sqrt{m+a} - \sqrt{m-r} = r \rightarrow m - n = r$$

$$m^r - n^r = m + a - n + r = a + r$$

$$(m+n)(\frac{m^r}{n}) = a + r \rightarrow m + n = \frac{a+r}{r}$$

$$\sqrt{m+a} + \sqrt{m-r} - r = ? \rightarrow m + n - r = \frac{a+r}{r} - \frac{r}{r} = \left(\frac{a}{r}\right)$$