

$$1! + 3! + 5! + \dots + 25! \quad \text{مجموع}$$

$$1! = 1$$

$$3! = 4$$

$$1 + 4 = 5$$

المجموع

المجموع

(1)

$$14! + 12! + 10! + \dots + 2! \quad \text{مجموع}$$

$$1! = 1$$

$$2! = 2$$

$$3! = 6 \rightarrow \text{مجموع} = 6$$

$$4 + 2 = 6$$

$$4 \times 2 = 8 \rightarrow \text{مجموع} = 8$$

$$\sqrt[4]{(1+\sqrt{5})^{-1}} \cdot \sqrt[4]{(1+\sqrt{5})^2} = \sqrt[4]{\left(\frac{1}{1+\sqrt{5}}\right)(1+\sqrt{5})^2} = \sqrt[4]{\frac{(1+\sqrt{5})^2}{1+\sqrt{5}}} = \sqrt[4]{\frac{1+2\sqrt{5}+5}{1+\sqrt{5}}} = \sqrt[4]{\frac{2(1+\sqrt{5})}{1+\sqrt{5}}} = \sqrt[4]{2} \quad \text{(ج) (2)}$$

$$\frac{\sqrt{2} + \sqrt{5}}{\sqrt{10} + 2} \times \frac{\sqrt{10} - 2}{\sqrt{10} - 2} = \frac{2\sqrt{10} - 2}{10 - 4} = \frac{2\sqrt{10} - 2}{6} = \frac{\sqrt{10} - 1}{3}$$

$$\frac{\sqrt{2}}{2} (\sqrt{10} - \sqrt{5} - \sqrt{2} + \sqrt{10}) = \frac{\sqrt{2}}{2} (\sqrt{10} - \sqrt{5} - \sqrt{2} + \sqrt{10}) = \frac{\sqrt{2}}{2} (2\sqrt{10} - \sqrt{5} - \sqrt{2}) = \sqrt{2} - \frac{\sqrt{5}}{2} - \frac{1}{2}$$

(ب)

$$\frac{2\sqrt{2} + 3\sqrt{10}}{2 - \sqrt{4}} \times \frac{2 + \sqrt{4}}{2 + \sqrt{4}} = \frac{10\sqrt{2} + 3\sqrt{18} + 10\sqrt{10} + 2\sqrt{12}}{4 - 4} = \frac{19\sqrt{2} + 19\sqrt{3}}{19} = \sqrt{2} + \sqrt{3}$$

(ج) (3)

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

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

(ب)

$$\frac{2\sqrt{2} - 1}{2 + \sqrt{2}} \times \frac{2 - \sqrt{2}}{2 - \sqrt{2}} = \frac{12\sqrt{2} - 2 - 9 + \sqrt{2}}{4 - 2} = \frac{13\sqrt{2} - 11}{2} = \sqrt{2} - 1$$

$$\frac{1}{2 - \sqrt{2}} \times \frac{2 + \sqrt{2}}{2 + \sqrt{2}} = \frac{2 + \sqrt{2}}{4 - 2} = 1 + \frac{\sqrt{2}}{2}$$

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

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

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

(د) (4)

$$2\sqrt{2} \times 3\sqrt{2} \times 4\sqrt{2} = 24\sqrt{2} \times 3\sqrt{2} \times 4\sqrt{2} = 24 \times 3 \times 4 \times 2 = 576$$

(ب)

$$\frac{2^x(1+2+2^2+2^3+2^4+2^5)}{2^x\left(\frac{1}{2}+1+2+2^2+2^3+2^4\right)} = \frac{24}{1} = 24$$

$$\left(\frac{2}{1}\right)^x \times \frac{24}{1} = 24$$

$$\left(\frac{2}{1}\right)^x = 1 \times \frac{24}{1} \times \frac{1}{24} = 1$$

$$\left(\frac{2}{1}\right)^x = 1 \quad x = 0$$

(5)

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

$$= ((\sqrt{4}-2) + (\sqrt{4}+2) - 2\sqrt{(\sqrt{4}-2)(\sqrt{4}+2)})^2 = (2\sqrt{4}-2\sqrt{2})^2 = (2\sqrt{4}+1-19\sqrt{2}) = 32-19\sqrt{2}$$

(6)

$$32-19\sqrt{2} = t(2-\sqrt{2})$$

$$14(2-\sqrt{2})$$

$$t = 14$$

$$a = \sqrt[5]{(r - \sqrt{r})^2} = \sqrt[5]{r - \sqrt{r}} \quad \left(\left(a + \frac{1}{a} + \sqrt{r} \right) \left(a + \frac{1}{a} - \sqrt{r} \right) \right)^2 = a^2 + \frac{1}{a^2} + 1 + 1 - a\sqrt{r} - \frac{\sqrt{r}}{a} + a\sqrt{r} + \frac{\sqrt{r}}{a} - 1$$

$$= a^2 + \frac{1}{a^2} = \frac{a^4 + 1}{a^2} = \frac{r + 1 - r\sqrt{r} + 1}{r - \sqrt{r}} = \frac{1 - \sqrt{r}}{r - \sqrt{r}} = \frac{r(r - \sqrt{r})}{r - \sqrt{r}} = r = r^t \quad t = r$$

$$A = \sqrt[5]{5} \sqrt[5]{14} \times \left(\frac{1}{r} \right)^{-\frac{2}{5}}$$

$$\sqrt[5]{10\sqrt{r}} \times \sqrt[5]{r^2} = \sqrt[5]{10\sqrt{r}^2} \times \sqrt[5]{r^2} = \sqrt[5]{10\sqrt{r}^4} = \sqrt[5]{40r^2} = 5$$

$$\sqrt[5]{ra} = r\sqrt[5]{a}$$

$$\sqrt[5]{\frac{a}{a^2a}} = r\sqrt[5]{a}$$

$$\sqrt[5]{\frac{1}{a^2a}} = r\sqrt[5]{a}$$

$$\frac{1}{a^2} = r\sqrt[5]{a}$$

$$a^2 = \frac{1}{r\sqrt[5]{a}}$$

$$a = \frac{\sqrt[5]{r}}{9} = \frac{\sqrt[5]{r}}{9}$$

$$\frac{1}{a} = \frac{9}{\sqrt[5]{r}} \times \frac{\sqrt[5]{r}}{\sqrt[5]{r}} = \frac{9\sqrt[5]{r}}{\sqrt[5]{r}} = 9\sqrt[5]{r}$$

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

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

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

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

$$\sqrt{x-d} + r\sqrt{x-d} = r \Rightarrow r\sqrt{x-d}$$