Subject. ۲۱ طبیعی

Day. Month. Year.

دهم ریاضی C

ایل ماه سال

$(1+4+5+\cdots+50)(2+4+6+\cdots+50) =$ (۱)

$7 \times 4 =$ (۲)

(۳)

الف) $\sqrt[4]{(4+\sqrt{7})^{-1}(1+\sqrt{7})^{2}} = \sqrt[4]{\frac{1+7+2\sqrt{7}}{4+\sqrt{7}}} = \sqrt[4]{\left(\frac{8+2\sqrt{7}}{4+\sqrt{7}}\right)}$

$\sqrt[4]{2}$

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

$\frac{2\sqrt{5}}{20} - 2\sqrt{2} + \frac{5\sqrt{2}}{50} - 2\sqrt{5}\left(\sqrt{2-\sqrt{5}}-\sqrt{3+\sqrt{5}}\right)$

$\frac{10-4}{6}$

$\frac{12\sqrt{2}}{24}\left(\sqrt{3-\sqrt{5}}-\sqrt{3+\sqrt{5}}\right) =$

$\frac{\sqrt{6-2\sqrt{5}}}{(\sqrt{5}-1)2} - \frac{\sqrt{6+2\sqrt{5}}}{2} = \frac{\sqrt{5}-1-\sqrt{5}-1}{4}$

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(٣)

أ) $\frac{2\sqrt{2}+2\sqrt{3}\times(2+\sqrt{6})}{2-\sqrt{4\times(2+\sqrt{6})}} - 2(\sqrt{3}-1)^{-1} = \frac{10\sqrt{2}+4\sqrt{3}+12\sqrt{2}+6\sqrt{3}}{2-4} = -19\sqrt{3}$

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

$\boxed{\sqrt{2}-1}$. 1

ب) $\frac{3\sqrt{3}-1(4-\sqrt{3})}{4+\sqrt{3}(4-\sqrt{3})} + (2-\sqrt{3})^{-1} = \frac{12\sqrt{3}-9-4+\sqrt{3}}{16-13} + \frac{1}{2-\sqrt{3}\times(2+\sqrt{6})} = \boxed{3+2\sqrt{3}}$

(٤)

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

$A^2 = \frac{2+\sqrt{3}+\sqrt{6}-1+2\sqrt{3-1}}{\sqrt{3}-\sqrt{2}} = \frac{2\sqrt{3}+2\sqrt{2}}{\sqrt{3}-\sqrt{2}} \times \frac{(\sqrt{6}+\sqrt{2})}{(\sqrt{6}+\sqrt{2})}$

$\frac{4+2\sqrt{4}+2\sqrt{4}+4}{1} = 10+4\sqrt{4} = (\sqrt{4}+2)^2 \Rightarrow A = \sqrt{4}+2$

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ب) $\sqrt[3]{2^{8+2}} \times \sqrt[4]{16^4 \times 2} \times \sqrt[11]{2^{12}}$

$2^{\frac{8+2}{3}} \times 2^{\frac{1}{4}} \times 2^{\frac{4}{11}} \times 2 \times 2 = 4 \times 2^{\frac{8+2+1}{11}} = 4 \times 2 = 8$ (۱۲)

ج)

$$\frac{2^{2n}\left(1+2^2+9+81+2^4+2^7\right)}{2^{n-2}\left(1+2^2+4+8+16+2^5\right)} = 2^2 \times 12$$

$$\frac{2^{2n} \times 2^4 \times 31}{2^{n-2} \times 9 \times 31} = 4 \times 12 \Rightarrow 2^{2n} = 2^{n-2} \times 2^2$$

$$2^{2n-2} = 2^{n-2}$$

$$n-2 = 0$$

$$\boxed{n = 2}$$

۴)

$$(a+b)^3 (a-b)^4 = 4(2-\sqrt{3})$$

$$(a^2-b^2)^4 = 4(2-\sqrt{3})$$

$$\left(\sqrt{4-2}-\sqrt{4-2}\right)^4 = 4(2-\sqrt{3})$$

$$(1^2)^4 = 4(2-\sqrt{3})$$

$$4 = 4(2-\sqrt{3}) \Rightarrow$$

$$\epsilon = \frac{4}{2-\sqrt{3}} =$$

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$$\left((a+\frac{1}{a})^2-2\right)^2 = 2^t \Rightarrow (a^2+\frac{1}{a^2}+2-2)^2 \cdot (a+\frac{1}{a})^2$$

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

$$t=\varepsilon$$

$$a = \sqrt[\varepsilon]{(2-\sqrt{2})^2} = \sqrt{2-\sqrt{2}}$$

(٨)

$$A = 2^{\frac{2}{5}} \times 2^{\frac{\varepsilon}{12}} \times 2^{\frac{\varepsilon}{2}} = 2^{\frac{9+\varepsilon+20}{12}} = 2^2$$

$$(2A)^{-\frac{1}{2}} = \frac{1}{2}$$

(٩)

$$\sqrt[7]{a} = 2\sqrt{7} \times a^{\frac{12}{7}} \Rightarrow a^{\frac{1}{7}} = 3 \times a^{\frac{12}{7}}$$

$$a^{\frac{1}{7}-\frac{12}{7}} = 2^{-2} \Rightarrow a = 2^{-2} \Rightarrow a^{-1} = 2^{\frac{3}{2}}$$

$$\frac{3\sqrt{2}-2}{1+\sqrt{2}} \overset{a>0}{=} \frac{3\sqrt{2}-9-3+3\sqrt{2}}{1-3} = \frac{9\sqrt{2}-12}{-2}$$

$$2-3\sqrt{3}$$

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

$$x+a-x+\xi=2\left(\sqrt{x+a}+\sqrt{x-\xi}\right)$$

$$\frac{a}{2}+2=\sqrt{x+a}+\sqrt{x-\xi}$$

$$\boxed{\frac{a}{2}=\sqrt{x+a}+\sqrt{x-\xi}-2}$$