تکلیف شماره ۲۱ — باران قاسمی

Subject: Year: Month: Day:

۱۹/۵

۱- $(1!+3!+5!+\dots)(2!+4!+6!+\dots) = \dots$ (۲)

$1 \quad 6 \quad 0 \qquad 2 \quad 4 \quad 0$

$(1+6)(2+4) = 4(2)$

(۲) ✓

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

(۱/۵) ✓

ب) $\xrightarrow{\text{بسط}} \frac{2+\dots}{2(1+\dots)} \times (\dots) = \frac{1}{4} \times 4 = 1$

پایین صفحه

۳- الف) $\frac{3\sqrt{2}+3\sqrt{3}}{5-\sqrt{6}} - 2\times\frac{1}{\sqrt{3}-1} \to \frac{\sqrt{3}+1}{\sqrt{3}+1} = 2\times\frac{\sqrt{3}+1}{2} = -\sqrt{3}-1$

$\frac{19\sqrt{2}+19\sqrt{3}}{19} = \sqrt{2}+\sqrt{3}$ $\quad + \Big\} \ \sqrt{2}-1$

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

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

(۲) ✓

۴- الف) $\frac{(\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1})(\sqrt{1+\sqrt{3}}+\sqrt{1+\sqrt{3}})}{\sqrt{\sqrt{3}-\sqrt{2}}} = \sqrt{\frac{2(\sqrt{3}+\sqrt{2})}{\sqrt{3}-\sqrt{2}}} \overset{\text{گویا}}{=} \sqrt{\frac{10+4\sqrt{6}}{1}} = \sqrt{(\sqrt{6}+2)^2} = |\sqrt{6}+2|-2 = \sqrt{6}$

ب) $\sqrt[4]{4} \times 3\sqrt[3]{2} \times 2\sqrt[12]{2} \Rightarrow 2^{\frac{2}{4}} \times 3 \times 2^{\frac{1}{3}} \times 2^{\frac{1}{12}} \times 2 = 2^{\frac{12}{12}} \times 6 = 12$

(۲) ✓

۵- $\frac{3^x(1+3+9+27+81+243)}{2^{x-2}(1+2+4+8+16+32)} = 52$ $\quad (364,\ 63)$

$3^x \times 364 = 52 \times 2^{x-2} \times 63 \qquad 3^x = 2^{x-2} \times 9 \qquad 3^{x-2} = 2^{x-2}$

$x-2=0 \qquad x=2$

(۲) ✓

۶- $((a^2+b^2)^2-(2ab)^2)^2 \Rightarrow \sqrt{6}-2+\sqrt{6}+2-4\sqrt{2} = (2\sqrt{6}-2\sqrt{2})^2 = t(2-\sqrt{3}) = 24+8-16\sqrt{3} = t(2-\sqrt{3})$

$(\sqrt{\sqrt{6}-2}+\sqrt{\sqrt{6}+2})^2 \qquad 16(2-\sqrt{3}) = t(2-\sqrt{3}) \qquad t=16$

(۲) ✓

۷- $(a+\frac{1}{a}+\sqrt{2})^2(a+\frac{1}{a}-\sqrt{2})^2 = 2^t \qquad ((a+\frac{1}{a})^2-(\sqrt{2})^2)^2 \Rightarrow 2-\sqrt{3}+\frac{1}{2-\sqrt{3}}+2 = 2-\sqrt{3}+2+\sqrt{3}+2 = 6-2 = 4$

$\sqrt[4]{7-4\sqrt{3}} = \sqrt[4]{(2-\sqrt{3})^2} \qquad \frac{1\times(2+\sqrt{3})}{(2-\sqrt{3})\times(2+\sqrt{3})} \qquad 4^2=16 \qquad 2^t=2^4 \qquad t=4$

(۲) ✓

۸- $A = \sqrt[5]{4\sqrt[3]{16}} \qquad 2^{\frac{t}{3}} = (\frac{1}{2})^{-\frac{t}{3}}$

$\sqrt[15]{2^{10}} \Rightarrow 2^{\frac{2}{5}} \times 2^{\frac{4}{15}} = 2^{\frac{2}{3}} = 2^2 = 4 \qquad (2(4))^{-\frac{1}{3}} = \sqrt[3]{\frac{1}{8}} = \frac{1}{2}$

(۲) ✓

Pasha

Subject: Year: Month: Day:

$\sqrt[3]{a} = 27 \times a^{\frac{1}{3}} \Rightarrow 1 = 27 \times a^3 \Rightarrow a^3 = \frac{1}{27} \Rightarrow a = \frac{1}{3\sqrt{3}} \Rightarrow \frac{1}{a} = 3\sqrt{3}$ -9

$\frac{(3\sqrt{3}-2)\times(1-\sqrt{3})}{(1+\sqrt{3})\times(1-\sqrt{3})} = \frac{3\sqrt{3}-9-3+3\sqrt{3}}{-2} = -3\sqrt{3}+6$ ✓

$\frac{\sqrt{x+a}}{A} + \frac{\sqrt{x-4}}{B} - 2 = ?$ $\frac{\sqrt{x-a}}{A} - \frac{\sqrt{x-4}}{B} = 2$ -10

$A+B=2$ $A-B=2$ $A=B+2$ $A^2 = B^2+4+4B$

$B+2^2+B-2=?$ $2B = 2(\frac{a}{4} = \frac{a}{2})$ $x+a = a-4+4+4\sqrt{x-4}$ $B=\frac{a}{4}$ $a=4B$

✓

۲- ب

$$\underbrace{\left(\sqrt{3-\sqrt{5}}-\sqrt{3+\sqrt{5}}\right)}_{b}$$

$$b^2 = 3-\sqrt{5}+3+\sqrt{5}-2\sqrt{9-5} = 2$$

$$b^2 = 2 \rightarrow b = \pm\sqrt{2}$$

$$b = -2$$

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

$$a = \frac{1}{\sqrt{2}}$$

$$ab = -1$$