زینب تماشی کلاس A دهم

page: ( ) Subject: Year Month Day

۱۱

آخر فاکتوریل (۰!، ۱!، ... ۳۱!، ۴۱!، ۲۱!، ۲۵!، ... ۵۱!، ۱۱!) (۲k!)(۲k+۱!)

وجود عامل ۲ و ۵

۳

$1! = 1$, $3! = 6$ → ۷

$2! = 2$, $4! = 24$ → ۲۶

26×7 (۲)

حاصل عبارت

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الف) $\sqrt[4]{(4+\sqrt{7})^{-1}} \quad \sqrt{1+\sqrt{7}}^{\,4}$

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

ب) A: $\left[\frac{\sqrt{2}+\sqrt{5}}{\sqrt{10}+2}\right]\left(\sqrt{3-\sqrt{5}} - \sqrt{3+\sqrt{5}}\right)$

$\frac{\sqrt{2}+\sqrt{5}}{\sqrt{10}+2} \times \frac{\sqrt{10}-2}{\sqrt{10}-2} = \frac{\sqrt{20}-2\sqrt{2}+\sqrt{50}-2\sqrt{5}}{10-4} = \frac{3\sqrt{2}}{6}$ ... $\frac{\sqrt{2}}{2} \times 5 = \frac{5\sqrt{2}}{2}$

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

$A^2 = 3-\sqrt{5}+3+\sqrt{5}-2\sqrt{9-5} = 9-2\sqrt{4} = 5$

$b^2 = 2$

$b = \sqrt{2}$ ✗ $= -\sqrt{2}$ ✓

سوال ۳

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$\frac{\sqrt{8}+\sqrt{27}}{5-\sqrt{6}} - 2\left(\sqrt[4]{9}-1\right)^{-1}$

$\frac{(\sqrt{8}+\sqrt{27})(5+\sqrt{6})}{25-6} = \frac{5\sqrt{8}+\sqrt{48}+5\sqrt{27}+\sqrt{162}}{19} = \frac{19\sqrt{2}+19\sqrt{3}}{19} = \sqrt{2}+\sqrt{3} - 2(\sqrt[4]{9}-1)^{-1}$

$-2\sqrt{9}+2$

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

سوال ۴

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

$\left(\sqrt{\sqrt{3}+1} + \sqrt{\sqrt{3}-1}\right)^2 = 2\sqrt{3}+2\sqrt{2} = 2(\sqrt{3}+\sqrt{2}) \Rightarrow \frac{\sqrt{2}\sqrt{\sqrt{3}+\sqrt{2}}}{\sqrt{\sqrt{3}-\sqrt{2}}} \times \frac{\sqrt{\sqrt{3}+\sqrt{2}}}{\sqrt{\sqrt{3}+\sqrt{2}}}$

$\sqrt{2}\left(\sqrt{5}+\sqrt{6}\right)$

3×2 $\quad 6 \times 8$

Arman

ب) $\sqrt[12]{2^{8}\,3}\times\sqrt[4]{3^{4}\times 2}\times\sqrt[12]{2^{13}} = 2^{\frac{2}{3}}\times 6\times 2\times 2^{\frac{1}{12}} = \sqrt[12]{2^{8}\,3^{12}}$

$6 = 2\times 3$

$= 3^{3}\times 2^{3} = 12$

سوال ۵)

$$\frac{3^{x}+3^{x+1}+3^{x+2}+3^{x+3}+3^{x+4}+3^{x+5}}{2^{x-2}+2^{x-1}+2^{x}+2^{x+1}+2^{x+2}+2^{x+3}} = \frac{3^{4x+15}}{2^{4x+3}} = 52$$

$3^{4x+15}\times 2^{-4x-3} = 2^{2}\times 13 \qquad 2 = -4x-3 \qquad -4x = 5 \qquad x = -\frac{5}{4}$

سوال ۶)

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

$(a^{4}-b^{4})^{2} = a^{8}+b^{8}-2a^{4}b^{4} = (\sqrt{6}-2)^{2}+(\sqrt{6}+2)^{2}-2(\sqrt{6}+2)(\sqrt{6}-2)$

$6+4-4\sqrt{6}+6+4+4\sqrt{6}-4 \Rightarrow 10 = t(2-\sqrt{3}) \Rightarrow t = \frac{10}{2-\sqrt{3}}$

سوال ۷)

$a = \sqrt[4]{7-4\sqrt{3}} = \sqrt[4]{(2-\sqrt{3})^{2}}$

$$\left(\sqrt{2-\sqrt{3}}+\frac{1}{\sqrt{2-\sqrt{3}}}+\sqrt{2}\right)^{2}\left(\sqrt{2-\sqrt{3}}+\frac{1}{\sqrt{2-\sqrt{3}}}-\sqrt{2}\right)^{2}$$

گویا کردن

$(\sqrt{2-\sqrt{3}}+\sqrt{2-\sqrt{3}}+\sqrt{2})^{2}$

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

$4-2=2$

$1 = t$

$2 = 2$

سوال ۸)

$A = \sqrt[5]{4\sqrt[3]{16}} \qquad \left(\frac{1}{2}\right)^{-\frac{4}{3}} = \sqrt[15]{2^{6}\times 2^{4}} = \sqrt[15]{2^{10}}\times 2^{\frac{4}{3}}$

$16 = 2^{4}$

$= 2^{\frac{2}{3}}\times 2^{\frac{4}{3}} = 2^{\frac{6}{3}} = 2^{2} = A$

$(2A)^{-\frac{1}{3}} = (2^{3})^{-\frac{1}{3}} = 2^{-1}$

$2\times 2^{2} = 2^{3}$

سوال ۶)

$$\sqrt[7]{a} = 27 \times a^{\frac{15}{7}}$$

$$3^3 \times a^{\frac{15}{7}}$$

$$a^{\frac{1}{7}} = a^{\frac{15}{7}} \times 3^3$$

$$a^{\frac{1}{7} - \frac{15}{7}} = 3^3$$

$$a^{-\frac{14}{7}} = 3^3 = a^{-2} = 3^3$$

$$a^2 = \frac{1}{27}$$

$$a = \sqrt{\frac{1}{27}}$$

$$\frac{\left(\frac{1}{a} - 3\right)}{1+\sqrt{3}} = \frac{\sqrt{27} - 3}{1+\sqrt{3}} \quad (\sqrt{27} \to 3\sqrt{3})$$

$$\frac{3(\sqrt{3}-1)}{1+\sqrt{3}} \times \frac{1-\sqrt{3}}{1-\sqrt{3}} = \frac{-12+6\sqrt{3}}{1-3=-2} = \frac{-2(6-2\sqrt{3})}{-2}$$

$$2-\sqrt{3}$$

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

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(حل ۱۰)

$$\sqrt{x+a} + \sqrt{x-4} = A \quad \Rightarrow \quad A^2 = x+a-(x-4) = a+4$$

$$\sqrt{x+a} - \sqrt{x-4} = 2 \quad \Rightarrow \quad A = \frac{a+4}{2} = \sqrt{x+a} + \sqrt{x-4} \quad , \quad 2 = \frac{a+4}{2} - 4$$

(۲)

$$= \frac{a+4-4}{2} = \frac{a}{2}$$