۵ تکلیف بدون اسم ۵ صفر

(۱) (۲)

۱، ۱۵ ... = ۰

۱ → ۱
۳ → ۶ } (۷۴

۲! → ۲ }
۴! → ۴ } ۶ (۷)(۶) = ۴۲ ✓

(۲)

ب) $\sqrt[۲]{۱+\sqrt{۷}} = \sqrt[۴]{(۱+\sqrt{۷})^{۲}} \times \sqrt[۴]{(۴-\sqrt{۷})^{-۱}}$

$\sqrt[۴]{\frac{(۱+\sqrt{۷})^{۲}}{۴+\sqrt{۷}}} = \sqrt[۴]{\frac{۲(۴+\sqrt{۷})}{۴+\sqrt{۷}}} = ۲^{\frac{۱}{۴}}$ ✓

ا)

$\sqrt{۳-\sqrt{۵}} = \sqrt{۳-۲\sqrt{\frac{۵}{۴}}} = \sqrt{(\sqrt{\frac{۵}{۲}}-\sqrt{\frac{۱}{۲}})^{۲}} =$

$۲\frac{۵}{۴} \times \frac{۱}{۴} = ۲$

$\sqrt{\frac{۵}{۲}} - \sqrt{\frac{۱}{۲}} \Rightarrow \sqrt{۳-\sqrt{۵}} - \sqrt{۳+\sqrt{۵}} =$

$\sqrt{\frac{۵}{۲}} - \sqrt{\frac{۱}{۲}} - \sqrt{\frac{۵}{۲}} - \sqrt{\frac{۱}{۲}} = -۲\sqrt{\frac{۱}{۲}} =$

$-\sqrt{۲}$

$-\sqrt{۲}\left(\frac{\sqrt{۲+\sqrt{۵}}}{\sqrt{۱۰}+۲}\right) = \frac{-۲-\sqrt{۱۰}}{\sqrt{۱۰}+۲} = -۱$ ✓

۳

$\sqrt{۳}+\sqrt{۲} = \frac{\sqrt{۹}+\sqrt{۵}}{\sqrt{۹}+\sqrt{۵}} \times \frac{\sqrt{۳}+\sqrt{۲}}{\sqrt{۹}-\sqrt{۵}} = \frac{۳\sqrt{۳}+۳\sqrt{۲}+\sqrt{۱۵}+\sqrt{۱۰}}{۹-۵}$

$= \frac{\sqrt{۲۷}+\sqrt{۱۰}}{۴}$ ← جواب

$\frac{۱}{۲}(\sqrt{۳}+۱) = \frac{\sqrt{۳}+۱}{۲} \times \frac{\sqrt{۳}-۱}{\sqrt{۳}-۱} = \frac{۱}{\sqrt{۳}-۱}$

$(\sqrt[۴]{۹}-۱)^{-۱}$

$\frac{(\sqrt{۹}-۱)(۳\sqrt{۲}+۲\sqrt{۳})}{-۸(\sqrt[۴]{۹}+۱)} = -\sqrt[۴]{۹}$

$= \frac{\sqrt[۴]{۹}+۱}{\sqrt[۴]{۹}-۱} \times \frac{-۲}{\sqrt[۴]{۹}-۱} = -۲(\sqrt[۴]{۹}-۱)^{-۱}$

$\frac{-۸(\sqrt[۴]{۹}+۱)}{۲\sqrt{۲}} = \sqrt[۴]{۹}-۱ = \sqrt{۳}-۱$

$\Rightarrow \frac{(-\sqrt{۳}-۱۱)(۵-\sqrt{۶})}{۵-\sqrt{۶}} + \frac{\sqrt{۸}+\sqrt{۱۲}}{۵-\sqrt{۶}} = \frac{\sqrt{۶}+۵-۵\sqrt{۲}}{۵-\sqrt{۶}}$

$\frac{-۵(\sqrt{۳}+۱)+\sqrt{۶}(۱+\sqrt{۳})۵}{۵-\sqrt{۶}}$

$\Rightarrow \frac{(\sqrt{۳}+۱)(\sqrt{۶}-۵)}{۵-\sqrt{۶}} = \sqrt{۳}-۱$

$\frac{۳\sqrt{۳}-۱}{۶+\sqrt{۳}} \times \frac{\sqrt{۳}-۶}{\sqrt{۳}-۶} = \sqrt{۳}-۱$

جواب ← $۱+۲\sqrt{۳}$

$\frac{۱}{۲-\sqrt{۳}} = \frac{۲+\sqrt{۳}}{۲+\sqrt{۳}} \times \frac{۱}{۲-\sqrt{۳}} = ۲+\sqrt{۳}$

$(۲-\sqrt{۳})^{-۱}$

$\frac{(۲+\sqrt{۳})(۳\sqrt{۳}-۲)}{۴+\sqrt{۳}} + \frac{\sqrt{۱۲}-۱}{۴\sqrt{۳}-۳}$

$\frac{۳+۲\sqrt{۳}+۲\sqrt{۳}-۱۰+\sqrt{۱۲}}{۴+\sqrt{۳}} = \frac{۱۰+۴\sqrt{۳}}{۴+\sqrt{۳}}$

الف)

($\sqrt{9}$)

ب)

$\sqrt[4]{\sqrt[3]{2^8}} = \sqrt[12]{2^8} = 2^{\frac{8}{12}} = 2^{\frac{2}{3}}$

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

$3 \times 2^{\frac{1}{12}} \times 2^{\frac{12}{12}} \times 2^{\frac{3}{12}} \times 2^{\frac{8}{12}}$

$\sqrt{162} = \sqrt[4]{81} \times \sqrt[4]{2}$

3

(14) $= 3 \times 2^{\frac{12}{12}} \times 2^{\frac{12}{12}}$

$= 2\sqrt[12]{2} = 2\sqrt{6\sqrt{2}} = \sqrt[3]{2\sqrt[4]{2}}$

$2 \times 2^{\frac{1}{4}}$

1)

$3+9+27+81+243$

(5)

(2)

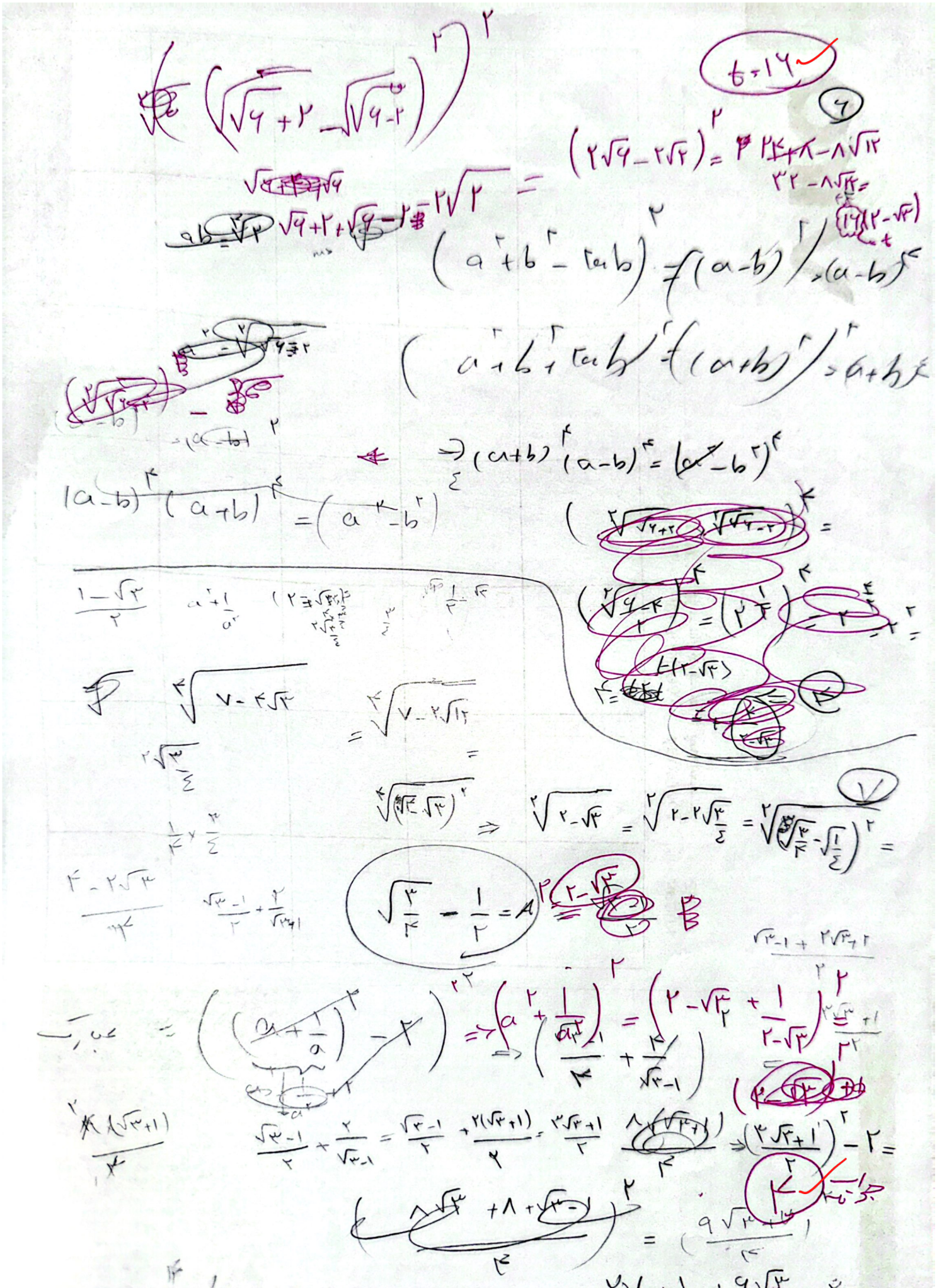
364

$\dfrac{3^n(1+3+\dots+3^5)}{2^n(2^{-2}+2^{-1}+1+2+2^2)} = 52$

$15/75$

$2^n \times 15/75 \times 52 = 3^n \times 364 \Rightarrow \dfrac{2^n}{3^n} = \dfrac{364}{819} = \dfrac{4}{9}$

$2^n = 4 \Rightarrow n = 2$



۹- $\sqrt[7]{a} = 27\, a^{\frac{15}{7}} \rightarrow a^{-2} = \frac{1}{27} \rightarrow a = \frac{1}{3\sqrt{3}}$

$(\frac{1}{a} - 3) = 3\sqrt{3} - 3 = 3(\sqrt{3} - 1)$

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

۸

$\sqrt[3]{2^{\frac{4}{3}} \times 2^{\frac{2}{3}}} \times 2^{\frac{2}{3}} = 2^{\frac{10}{3}} \times 2^{\frac{2}{3}} = 2^{\frac{12}{3}} = 2^4 = 16$

۹

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

۹

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

$a^{\frac{1}{7}} = 27 \times a^{\frac{15}{7}} \Rightarrow a^{\frac{1}{7}} \div a^{\frac{15}{7}} = 27$

$a^{-2} = 27$

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

$27a^2 = 1$

$a^2 = \frac{1}{27} \Rightarrow a = \frac{1}{\sqrt{27}} = (3\sqrt{3})^{-1}$

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

$\frac{1}{a} - 3 = \sqrt{27} - 3$

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

۱۰

$\sqrt{x+8} - \sqrt{x-2} = 1$

$\sqrt{x+8} + \sqrt{x-2} - 1 = ?$

b

$x+8 - x+2 = b$

$b = 10 \Rightarrow b = \frac{8+12}{2}$

۱۵- دو عبارت داده شده مزدوج یکدیگرند:

$$(\sqrt{x+a}+\sqrt{x-4})(\sqrt{x+a}-\sqrt{x-4}) = (x+a)-(x-4) = a+4$$

$$(\sqrt{x+a}+\sqrt{x-4})\times 2 = a+4 \rightarrow \sqrt{x+a}+\sqrt{x-4}-2 = \frac{a+4}{2}-2 = \boxed{\frac{a}{2}}$$