

$\sqrt{1}=1$ $\sqrt{5}:$ $\sqrt{4}$ $<\sqrt{5}$ < $\sqrt{9}$ ⬄ 2< $\sqrt{5}$ < 3

$\sqrt{4}=$ 2 διότι 22=4

$\sqrt{9}=3$ διότι 32=9 $\sqrt{68}: $ $\sqrt{64}$ < <$\sqrt{68}$ < $\sqrt{81}$ ⬄ 8 < $\sqrt{68}$ < 9

$\sqrt{16}=4$ $\sqrt{25}=5$

$\sqrt{36}=6$ $\sqrt{4}9=7$ $\sqrt{64}=8 $ $\sqrt{81}=9$ $\sqrt{100}=10$ $\sqrt{121}=11$

$\sqrt{144}$=12 $\sqrt{169}=13$ $\sqrt{196}=14$ $\sqrt{225}=15$ $\sqrt{256}$=16

$\sqrt{289}$=17 $\sqrt{324}$=18 $\sqrt{361}=19$ $\sqrt{400}=20$ $\sqrt{900}$=30



 ΔΕΝ ΙΣΧΥΕΙ : $\sqrt{α+β}=\sqrt{α}+\sqrt{β}$

$ 5=\sqrt{25}$ = $\sqrt{16+9}$ = $\sqrt{16}+\sqrt{9}$ = 4 +3 =7 ΛΑΘΟΣ



Θυμόμαστε την ταυτότητα : (α-β)(α+β) = α2 – β2

$\sqrt{5^{2}}= $5

$\sqrt{(-5)^{2}}= |-$5| = 5 = $\sqrt{25^{}}$

* ΠΡΟΣΟΧΗ $\sqrt{χ}\geq 0 όπου χ\geq 0$

Άρα

 $(\sqrt{χ}$ )2 = χ διότι χ$\geq 0$

$\sqrt{χ^{2}}$= |χ| διότι χ2 $\geq 0 $ ⬄ $χ\in R$

Π. χ . $\sqrt{9-6χ+χ^{2}}$ = $\sqrt{(3-χ)^{2}}$ = |3-χ |=

Χ-3=0 ⬄ χ=3 χ | $-\infty $ 3 $\infty $

 Χ-3 | - 0 +

Αν χ<3 τοτε χ-3<0 άρα $\sqrt{9-6χ+χ^{2}}$ = |3-χ |= -3+χ

Αν χ$\geq $3 τοτε χ-3$\geq $0 άρα $\sqrt{9-6χ+χ^{2}}$ = |3-χ |= 3-χ

Π.χ.( $\sqrt{χ-3})$ 2=χ-3 διότι χ-3$\geq 0 δλδ χ\geq 3$

**ΑΣΚΗΣΗ 2 Β ΟΜΆΔΑΣ ΣΕΛ75**

Α) $(3+2\sqrt{7})2$ = 32+12$\sqrt{7}+(2\sqrt{7})$2= 9 +12$\sqrt{7}+ $28 = $37+12\sqrt{7}$

 (3-2$\sqrt{7}$)2 = 32-12$\sqrt{7}+(2\sqrt{7})$2= 9 -12$\sqrt{7}+ $28 = 37-12$\sqrt{7}$

Β) $\sqrt{37+12\sqrt{7}} $- $\sqrt{37-12\sqrt{7}}$ = $\sqrt{\left(3+2\sqrt{7}\right)}$ 2 - $\sqrt{ (3-2\sqrt{7})2}$

 = |$3+2\sqrt{7}|$- |$3-2\sqrt{7}|$=$3+2\sqrt{7}$ - (2$\sqrt{7}-3)=$

= $3+2\sqrt{7}$ - 2$\sqrt{7}+ 3$ = 6

 (2$\sqrt{7}$)2 =28 άρα 3<2$\sqrt{7} δλδ$3-2$\sqrt{7}<0$



* $\sqrt[3]{χ}$= α, όταν α3= χ ( α,χ $\geq 0)$

$\sqrt[3]{8}$ = 2 , διότι 23 = 8

$\sqrt[3]{27}$ = 3 , διότι 33 = 27

$\sqrt[3]{125}$ = 5, διότι 53 = 125

$\sqrt[3]{5} $ = 1,……

* $\sqrt[4]{χ}$= α, όταν α4= χ ( α,χ $\geq 0)$

$\sqrt[4]{1}= $1, διότι 14 = 1

$\sqrt[4]{81}$ = 3, διότι 34= 81

* $\sqrt[ν]{χ}$= α, όταν αν= χ ( α,χ $\geq 0)$ ν$\in Ν$\*

Προσοχή : $\sqrt[2]{5}$ = $\sqrt{5}$ , $\sqrt[1]{5}$ = 5



Μετατροπή άρρητου παρονομαστή σε ρητό:

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

$\frac{-3}{\sqrt[5]{χ^{3}}}$ = $\frac{-3\sqrt[5]{χ^{2}}}{\sqrt[5]{χ^{3}}\sqrt[5]{χ^{2}}}$ = $\frac{-3\sqrt[5]{χ^{2}}}{\sqrt[5]{χ^{3}χ^{2}}}$ = $\frac{-3\sqrt[5]{χ^{2}}}{\sqrt[5]{χ^{5}}}$ = $\frac{-3\sqrt[5]{χ^{2}}}{χ}$ όπου χ>0

$\frac{5}{\sqrt[4]{χ^{3}}}$ =

$\frac{-3}{\sqrt[3]{2^{}}}$ =

$\frac{7}{\sqrt[6]{χ^{3}}}$ =

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* $\sqrt[3]{x^{5}}$ = $\sqrt[3]{x^{3}x^{2}}=\sqrt[3]{x^{3}}\sqrt[3]{x^{2}}$ = x $\sqrt[3]{x^{2}}$

 ή

$\sqrt[3]{x^{5}}$ = $χ^{\frac{5}{3}}= χ^{\frac{3}{3}+\frac{2}{3}}= χ^{1+\frac{2}{3}}$= χ$∙χ^{\frac{2}{3}}=χ∙\sqrt[3]{x^{2}}$

* $\sqrt[4]{x^{10}}$ = $χ^{\frac{10}{4}}$ = $χ^{\frac{5}{2}}$ = $χ^{\frac{4}{2}+\frac{1}{2}}$ = $χ^{2+\frac{1}{2}}$= Χ2 $χ^{\frac{1}{2}}$ =χ2 $\sqrt{x^{}}$

 $\sqrt[4]{x^{10}}$ = $\sqrt[4]{x^{4+4+2}}$ = $\sqrt[4]{x^{4}x^{4}x^{2}}$= $\sqrt[4]{x^{4}}\sqrt[4]{x^{4}}\sqrt[4]{x^{2}}$ =χχ$\sqrt[2∙2]{x^{2∙1}}$= χ2 $\sqrt{x^{}}$

* $\sqrt[4]{\sqrt[3]{χ^{2}}}$ = $\sqrt[4∙3]{χ^{2}}$ = $\sqrt[12]{χ^{2}}$ = $\sqrt[2∙6]{χ^{2}}$ = $\sqrt[6]{χ^{}}$
* $\sqrt[6]{5^{2}} ∙\sqrt{5^{9}} ∙\sqrt[3]{25^{4}}$ = $5^{\frac{2}{6}}∙5^{\frac{9}{2}}∙25^{\frac{4}{3}}$ = $5^{\frac{2}{6}}∙5^{\frac{9}{2}}∙ (5^{2})^{\frac{4}{3}}$ =

$ = 5^{\frac{2}{6}}∙5^{\frac{9}{2}}∙ 5^{\frac{8}{3}} = 5^{\frac{2}{6}+\frac{9}{2}+\frac{8}{3}}$ = $5^{\frac{45}{6}}$= $5^{\frac{15}{2}}$= $5^{\frac{14}{2}+\frac{1}{2}}$ = 57$∙ 5^{\frac{1}{2}}$ = 57$∙\sqrt{χ}$

* $\sqrt[5]{x^{2}}∙\sqrt[3]{x^{4}}$ =