

ΕΡΓΑΣΙΑ ΧΡΙΣΤΟΜΕΝΟΥΝΩΝ
Β' ΓΥΜΝΑΣΙΟΥ

1. (i) $x=0$ (ii) αύξουσα ή φθίνουσα (iii) επίσημα του βαθμού
(iv) άπειρες λύσεις

2. Γραφικό βιβλίο αραχίδας σελ. 41.

Ιδιότητες: (i) $\sqrt{a} \cdot \sqrt{b} = \sqrt{a \cdot b}$

(ii) $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

(iii) $\sqrt{a^2} = a$

3. α) $\sqrt{9^2} + \sqrt{(-16)^2} + \sqrt{100^2} = 9 + \sqrt{256} + 100 = 9 + 16 + 100 = 125$

β) $5(\sqrt{25^2} + \sqrt{25}) - \sqrt{(-3)^2} + \sqrt{18} \cdot \sqrt{2} = 5(25 + 5) - \sqrt{9} + \sqrt{18 \cdot 2} =$
 $= 5 \cdot 30 - 3 + \sqrt{36} = 150 - 3 + 6 = 153$

γ) $4\sqrt{7} + 2(\sqrt{5} - \sqrt{7}) + 7\sqrt{5} = 4\sqrt{7} + 2\sqrt{5} - 2\sqrt{7} + 7\sqrt{5} = 2\sqrt{7} + 9\sqrt{5}$

δ) $\Delta = \sqrt{21 + \sqrt{13 + \sqrt{7 + \sqrt{4}}}}$

$\Delta = \sqrt{21 + \sqrt{13 + \sqrt{7 + 2}}} = \sqrt{21 + \sqrt{13 + \sqrt{9}}} = \sqrt{21 + \sqrt{13 + 3}} = \sqrt{21 + \sqrt{16}}$

$\Delta = \sqrt{21 + 4} = \sqrt{25} = 5$

4. α) $\frac{-3x+2}{3} = \frac{x-2}{4} \quad \text{ΕΚΠ}(3,4)=12$

$\cancel{12} \cdot \frac{-3x+2}{3} = \cancel{12} \cdot \frac{x-2}{4}$

$4(-3x+2) = 3(x-2)$

$-12x + 8 = 3x - 6$

$-12x - 3x = -8 - 6$

$\frac{-15x}{-15} = \frac{-14}{-15}$

$x = \frac{14}{15}$

β) $\frac{x+1}{4} - \frac{2x-1}{3} + \frac{5x+2}{12} = 0$

$\text{ΕΚΠ}(3,4,12)=12$

$\cancel{12} \cdot \frac{x+1}{4} - \cancel{12} \cdot \frac{2x-1}{3} + \cancel{12} \cdot \frac{5x+2}{12} = 12 \cdot 0$

$3(x+1) - 4(2x-1) + 5x+2 = 0$

$3x+3 - 8x+4 + 5x+2 = 0$

$3x - 8x + 5x = -3 - 4 - 2$

$0x = -9$

Αδύνατον

$$5. \quad 1) \quad \frac{2x-1}{3} - \frac{2x-5}{6} > \frac{x+2}{3}$$

$$EK\pi(3,6)=6$$

$$\cancel{6} \cdot \frac{2x-1}{\cancel{3}} - \cancel{6} \cdot \frac{2x-5}{\cancel{6}} > \cancel{6} \cdot \frac{x+2}{\cancel{3}}$$

$$2(2x-1) - (2x-5) > 2(x+2)$$

$$4x-2-2x+5 > 2x+4$$

$$4x-2x-2x > 4+2-5$$

$$0x > 1$$

Αδύνατον

$$2) \quad \frac{3x+1}{8} < \frac{1}{2} - \frac{x-4}{6}$$

$$\hookrightarrow \frac{3x+1}{3} < \frac{3x-1}{2} - \frac{2}{3}$$

$$EK\pi(2,6,8)=24$$

$$\cancel{24} \cdot \frac{3x+1}{\cancel{8}} < \cancel{24} \cdot \frac{1}{\cancel{2}} - \cancel{24} \cdot \frac{x-4}{\cancel{6}}$$

$$3(3x+1) < 12 \cdot 1 - 4(x-4)$$

$$9x+3 < 12-4x+16$$

$$9x+4x < 12+16-3$$

$$\frac{13x}{13} < \frac{25}{13}$$

$$x < \frac{25}{13}$$

$$EK\pi(2,3)=6$$

$$\cancel{6} \cdot \frac{3x+1}{\cancel{3}} < \cancel{6} \cdot \frac{3x-1}{\cancel{2}} - \cancel{6} \cdot \frac{2}{\cancel{3}}$$

$$2(3x+1) < 3(3x-1) - 2 \cdot 2$$

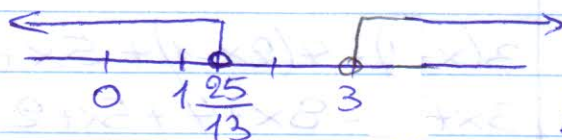
$$6x+2 < 9x-3-4$$

$$6x-9x < -3-4-2$$

$$-3x < -9$$

$$\frac{-3x}{-3} > \frac{-9}{-3}$$

$$x > 3$$



ΔΕΝ ΕΧΟΥΝ ΚΟΙΝΕΣ ΛΥΣΕΙΣ.

$$3. \quad \frac{3x-5}{2} - \frac{8x-121}{10} < \frac{4x-2}{5}$$

$$\hookrightarrow \frac{13}{12} - \frac{5x-1}{6} > \frac{x-2}{3}$$

$$EK\pi(2,5,10)=10$$

$$\cancel{10} \cdot \frac{3x-5}{\cancel{2}} - \cancel{10} \cdot \frac{8x-121}{\cancel{10}} < \cancel{10} \cdot \frac{4x-2}{\cancel{5}}$$

$$5(3x-5) - (8x-121) < 2(4x-2)$$

$$EK\pi(12,3,6)=12$$

$$\cancel{12} \cdot \frac{13}{\cancel{12}} - \cancel{12} \cdot \frac{5x-1}{\cancel{6}} > \cancel{12} \cdot \frac{x-2}{\cancel{3}}$$

$$13 - 2(5x-1) > 4(x-2)$$

(2)

$$15x - 25 - 8x + 121 < 8x - 4$$

$$15x - 8x - 8x < -4 + 25 - 121$$

$$-x < -100$$

$$\frac{-x}{-1} > \frac{-100}{-1}$$

$$x > 100$$

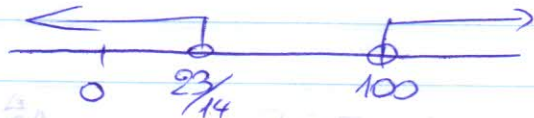
$$13 - 10x + 2 > 4x - 8$$

$$-10x - 4x > -2 - 8 - 13$$

$$-14x > -23$$

$$\frac{-14x}{-14} < \frac{-23}{-14}$$

$$x < \frac{23}{14}$$



ΔΕΥ ΕΧΟΥΝ ΚΟΙΝΕΣ
ΛΥΣΕΙΣ.

$$6. \alpha) 5(1-x) + 3 = 2x + 5 + 5$$

$$5 - 5x + 3 = 2x + 10$$

$$-5x - 2x = 10 - 5 - 3$$

$$\frac{-7x}{-7} = \frac{2}{-7}$$

$$\boxed{x = -\frac{2}{7}}$$

$$6) -2(1-x) + 3 = 2x + 5 - 2$$

$$-2 + 2x + 3 = 2x + 5 - 2$$

$$2x - 2x = +5 - 2 + 2 - 3$$

$$0x = 2$$

ΑΔΥΝΑΤΟΝ

$$7. \alpha) 3 - 2(\lambda - 1) = 7$$

$$3 - 2\lambda + 2 = 7$$

$$-2\lambda = 7 - 3 - 2$$

$$\frac{-2\lambda}{-2} = \frac{2}{-2}$$

$$\boxed{\lambda = -1}$$

$$7) 2 - \frac{y+3}{4} = 3 - 2y$$

$$4 \cdot 2 - \frac{y+3}{4} = 4 \cdot 3 - 4 \cdot 2y$$

$$8 - (y+3) = 12 - 8y$$

$$8 - y - 3 = 12 - 8y$$

$$-y + 8y = 12 - 8 + 3$$

$$\frac{7y}{7} = \frac{7}{7}$$

$$\boxed{y = 1}$$

$$6) 2(k-1) > 4$$

$$2k - 2 > 4$$

$$2k > 4 + 2$$

$$\frac{2k}{2} > \frac{6}{2}$$

$$\boxed{k > 3}$$



Το -1 δεν είναι λύση της ανίσωσης
αφού $-1 < 3$.

③

8. i) οριζώνιος γωνία βιβλίου 6εκ. 128

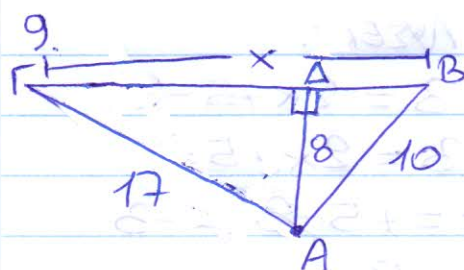
ii) -11- < x -11- 6εκ. 128

$$14^2 = 196$$

$$11^2 + 12^2 = 121 + 144 = 265$$

Δεν είναι ορθογώνιο.

- iii) (α) $\wedge$ $ZE^2 = DE^2 - \Delta Z^2$ (δ) Σ
 (β) Σ (ε) $\wedge$
 (γ) Σ



Εφαρμόζω Π.Θ. στο $\triangle B\Delta$:

$$\Delta B^2 = 10^2 - 8^2$$

$$\Delta B^2 = 100 - 64$$

$$\Delta B^2 = 36$$

$$\Delta B = \sqrt{36}$$

Εφαρμόζω Π.Θ. στο $\triangle A\Gamma\Delta$:

$$\Delta \Gamma^2 = 17^2 - 8^2$$

$$\Delta \Gamma^2 = 289 - 64$$

$$\Delta \Gamma^2 = 225$$

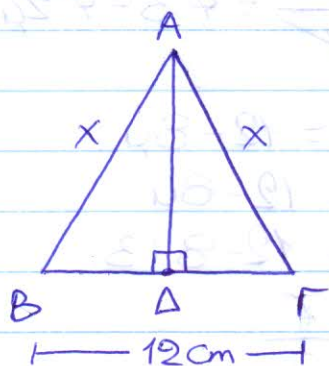
$$\Delta \Gamma = \sqrt{225}$$

$$\Delta \Gamma = 15$$

$$\Delta B = 6$$

$$\text{οπότε } x = \Delta B + \Delta \Gamma = 6 + 15 = 21 \text{ cm.}$$

10.



$$a) AB + AG + BG = 32$$

$$x + x + 12 = 32$$

$$2x = 20$$

$$x = 10 \text{ cm}$$

$$\text{όρα } AB = AG = 10 \text{ cm}$$

Εφαρμόζω Π.Θ. στο $\triangle A\Delta$:

$$A\Delta^2 = 10^2 - 6^2$$

$$A\Delta^2 = 100 - 36$$

$$A\Delta^2 = 64$$

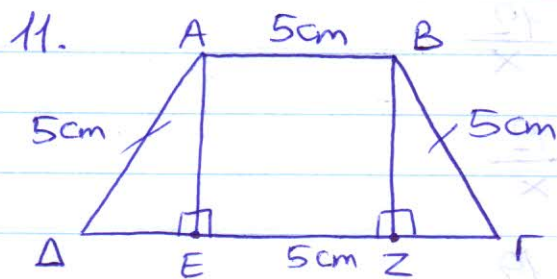
$$A\Delta = \sqrt{64}$$

$$A\Delta = 8 \text{ cm}$$

$$B\Delta = \Delta \Gamma = \frac{12}{2} = 6 \text{ cm}$$

$$b) E_{\text{trap}} = \frac{b \cdot u}{2} = \frac{B\Gamma \cdot A\Delta}{2} = \frac{12 \cdot 8}{2} = 48 \text{ cm}^2$$

$$m \angle B \cong m \angle \Gamma$$



$$\Pi = 26 \quad \text{τότε} \quad 5 + 5 + 5 + \Delta\Gamma = 26$$

$$15 + \Delta\Gamma = 26$$

$$\Delta\Gamma = 11 \text{ cm}$$

$$\Delta\Gamma = \underline{\Delta E} + \underline{EZ} + \underline{Z\Gamma} \quad \text{τότε} \quad 11 = 2\Delta E + 5$$

$$2\Delta E = 6$$

$$\Delta E = 3 \text{ cm} = Z\Gamma$$

Εφαρμόζω Π.Θ. στο $\triangle A\Delta E$:

$$AE^2 = 5^2 - 3^2$$

$$AE^2 = 25 - 9$$

$$AE^2 = 16$$

$$AE = \sqrt{16}$$

$$AE = 4 \text{ cm}$$

$$K' \quad E_{\text{trap}} = \frac{(b+B) \cdot u}{2}$$

$$E = \frac{(5+11) \cdot 4}{2}$$

$$E = 32 \text{ cm}^2$$

12. α) Εφαρμόζω Π.Θ.: $x^2 + x^2 = 10^2$

$$\frac{2x^2}{2} = \frac{100}{2}$$

$$x^2 = 50$$

$$x = \sqrt{50}$$

$$x = \sqrt{2 \cdot 25}$$

$$x = 5\sqrt{2} \text{ cm}$$

$$b) \quad \eta \gamma 62^\circ = \frac{20}{x}$$

$$0,8829 = \frac{20}{x}$$

$$0,8829x = 20$$

$$x = \frac{20}{0,8829}$$

$$\gamma) \quad \eta \gamma 30^\circ = \frac{x}{16}$$

$$0,5 = \frac{x}{16}$$

$$x = 0,5 \cdot 16$$

$$x = 8 \text{ cm}$$

(5)

$$\delta) \quad \sigma \gamma 60^\circ = \frac{8}{x}$$

$$0,5 = \frac{8}{x}$$

$$0,5x = 8$$

$$x = \frac{8}{0,5}$$

$$x = 16 \text{ cm}$$

$$x \approx 22,65 \text{ cm}$$

$$e) \quad \phi 70^\circ = \frac{x}{3}$$

$$2,7475 = \frac{x}{3}$$

$$x = 2,7475 \cdot 3$$

$$x = 8,2425 \text{ cm}$$

$$6c) \quad \phi 50^\circ = \frac{12}{x}$$

$$1,1918 = \frac{12}{x}$$

$$1,1918 \cdot x = 12$$

$$x = \frac{12}{1,1918}$$

$$x \approx 10,069$$



$$x \approx 3,4$$

$$x \approx 3,4$$

$$\frac{x}{2} = 2,0$$

$$x \approx 4$$

(6)