

Εξισώσεις

Ερωτήματα
10

1. ⑥ $x - (3x - 1) = 1 - 2 \cdot (3x - 2)$

$$x - 3x + 1 = 1 - 6x + 4$$

$$-2x + 1 = 5 - 6x$$

$$6x - 2x = 5 - 1$$

$$4x = 4$$

$$\underline{\underline{x = 1}}$$

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

$$1 + 2x - 2 = x - 2x + 1$$

$$-1 + 2x = -x + 1$$

$$2x + x = 1 + 1$$

$$3x = 2$$

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

$$2. \textcircled{B} \quad 1 - (2x - 1) = x - 2 \cdot (x - 3)$$

$$1 - 2x + 1 = x - 2x + 6$$

$$2 - 2x = -x + 6$$

$$-2x + x = 6 - 2$$

$$-x = 4$$

$$x = -4$$

$$\textcircled{D} \quad 3(x - 1) = 1 - (x + 4)$$

$$3x - 3 = 1 - x - 4$$

$$3x + x = 3 + 1 - 4$$

$$4x = 0$$

$$x = 0$$

$$3. \textcircled{n} \quad \frac{3x-2}{5} = 2$$

$$5 \frac{3x-2}{5} = 5 \cdot 2$$

$$3x-2 = 10$$

$$3x = 12$$

$$\underline{\underline{x = 4}}$$

$$3. \textcircled{B} \quad \frac{5x}{2} - \frac{x}{6} = x - 1$$

$$6 \cdot \frac{5x}{2} - 6 \cdot \frac{x}{6} = 6 \cdot x - 6 \cdot 1$$

$$3 \cdot 5x - x = 6x - 6$$

$$15x - x - 6x = -6$$

$$\frac{8x}{8} = \frac{-6}{8}$$

$$x = -\frac{6}{8}$$

$$\textcircled{8} \quad \frac{3x-1}{2} - \frac{x-1}{6} = -x+1$$

$$3 \cdot \frac{3x-1}{2} - \frac{6(x-1)}{6} = 6(-x+1)$$

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

$$9x-3-x+1 = -6x+6$$

$$-3+1-6 = -9x-6x$$

$$-8 = -15x$$

$$8 = 15x$$

$$x = \frac{8}{15}$$

$$3. \textcircled{02} \quad \frac{2(1-3x)}{5} - \frac{3}{2} \cdot (x-1) = -x+2$$

$$10 \cdot \frac{2(1-3x)}{5} - 10 \cdot \frac{3}{2} \cdot (x-1) = -10x+2 \cdot 10$$

$$2 \cdot 2(1-3x) - 5 \cdot 3(x-1) = -10x+20$$

$$4(1-3x) - 15(x-1) = -10x+20,$$

$$4 - 12x - 15x + 15 = -10x + 20$$

$$-12x - 15x + 10x = -4 - 15 + 20$$

$$-27x + 10x = 1$$

$$\frac{-17x}{-17} = \frac{1}{-17}$$

$$x = -\frac{1}{17}$$

$$6. \textcircled{6} \quad x^3 = 2x^2$$

$$x^3 - 2x^2 = 0$$

$$x^2(x-2) = 0$$

$$x=0 \quad \text{or} \quad x-2=0$$

$$x=2$$

$$\textcircled{62} \quad -x^2 + x = 0$$

$$-x(x-1) = 0$$

$$-x=0 \quad \text{or} \quad x-1=0$$

$$x=1$$

$$\textcircled{7} \quad x^3 - 2x^2 + x = 0$$

$$x(x^2 - 2x + 1) = 0$$

$$\textcircled{x=0}$$

or

$$x^2 - 2x + 1 = 0$$

$$(x-1)^2 = 0$$

$$x-1 = 0$$

$$\textcircled{x=1}$$

$$7. \textcircled{B} x^2 - 2x(x-1) = x.$$

$$x^2 - 2x^2 + 2x = x$$

$$-x^2 + 2x - x = 0$$

$$-x^2 + 2x - x = 0$$

$$-(x^2 - 2x + x) = 0$$

$$-(x^2 - x) = 0$$

$$-x(x-1) = 0$$

$$\textcircled{x=0} \quad \text{; } x-1=0$$

$$\textcircled{x=1}$$

$$\textcircled{D} (x-2)^2 - (2x-1)(x-4) = 0.$$

$$x^2 - 4x + 4 - (2x^2 - 8x - x + 4) = 0$$

$$x^2 - 4x + 4 - 2x^2 + 8x + x - 4 = 0$$

$$-x^2 + 5x = 0$$

$$x(-x + 5) = 0$$

$$\textcircled{x=0} \quad \text{; } -x + 5 = 0$$

$$-x = -5$$

$$\textcircled{x=5}$$

$$4. \textcircled{B} \frac{x-a}{2} - \frac{3a-x}{3} = -x+a$$

$\hookrightarrow x=a$ put a to -2 .

$$\frac{-2-a}{2} - \frac{3a-(-2)}{3} = -(-2)+a$$

$$6. \frac{-2-a}{2} - 6 \cdot \frac{3a+2}{3} = 6 \cdot 2 + a$$

$$-6-3a - \cancel{6a+4} = 12+6a$$

$$-3a-6a-6a = 12+4+6$$

$$\frac{-15a}{-15} = \frac{22}{-15}$$

$$5. \textcircled{B} (x-2)(x-3) = (x-1)^2$$

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

$$\cancel{x^2} - 3x - \cancel{2x} + 6 = \cancel{x^2} - \cancel{2x} + 1$$

$$-3x + 6 = 1$$

$$\frac{-3x}{-3} = \frac{-5}{-3}$$

$$x = \frac{5}{3}$$

$$\textcircled{8} 1 - (2x-1)^2 = x - 2x(2x-3)$$

$$1 - (4x^2 - 4x + 1) = x - 4x^2 + 6x$$

$$1 - \cancel{4x^2} + 4x - 1 = x - \cancel{4x^2} + 6x$$

$$4x - 6x - x = -1 + 1$$

$$\frac{-3x}{-3} = \frac{0}{-3} \Rightarrow x = -\frac{0}{3}$$

$$\textcircled{62} x(x-3)^2 + 8 = (x-2)^3$$

$$x(x^2 - 6x + 9) + 8 = x^3 - 3 \cdot x^2 \cdot 2 + 3 \cdot x \cdot 2^2 - 2^3$$

$$\cancel{x^3} - \cancel{6x^2} + 9x + 8 = \cancel{x^3} - \cancel{6x^2} + 12x - 8$$

$$9x + 8 = 12x - 8$$

$$9x - 12x = -8 - 8$$

$$-3x = -16$$

$$x = \frac{16}{3}$$

$$1. \quad \textcircled{20} \quad \frac{x}{x^2-1} = \frac{1}{x+1}$$

$$\frac{x}{(x-1)(x+1)} = \frac{1}{x+1}$$

$$(x-1)(x+1) \frac{x}{(x-1)(x+1)} = (x-1)(\cancel{x+1}) \frac{1}{\cancel{x+1}}$$

$$x = (x-1) \cdot 1$$

$$x = x - 1$$

$$0 = -1$$

Answer!

Περιορισμοί

$$\bullet x-1=0 \Rightarrow x=1$$

$$\bullet x+1=0 \Rightarrow x=-1$$

10. Ⓞ $\frac{x^2-1}{x^2-x} = 1 + \frac{1}{x}$

$$\frac{x^2-1}{x(x-1)} = 1 + \frac{1}{x}$$

• $x(x-1)=0 \Rightarrow x=0 \text{ ή } x=1$

$x=0$

ΕΚΠ: $x(x-1)$

$$\frac{\cancel{x(x-1)}(x^2-1)}{\cancel{x(x-1)}} = x(x-1) + \frac{\cancel{x(x-1)}}{\cancel{x}}$$

$$x^2-1 = x(x-1) + (x-1)$$

$$\cancel{x^2-1} = \cancel{x^2} - \cancel{x} + \cancel{x} - 1$$

$$0 = 0$$

Απορρίπτω αφού έχω
σημείο λωπ

$$x \in \mathbb{R} - \{0, 1\}$$

ηρηνυ
 $x \neq 0$
 $x \neq 1$

10. B $\frac{9x-1}{9x^2-1} + \frac{1}{1-3x} = \frac{2}{3x+1}$

$$\frac{9x-1}{(3x-1)(3x+1)} + \frac{1}{(-1+3x)} = \frac{2}{3x+1}$$

Πρέπει $x \neq -\frac{1}{3}$
 $x \neq \frac{1}{3}$

$$\frac{(3x-1)\cancel{(3x+1)}}{(3x-1)\cancel{(3x+1)}} \cdot \frac{9x-1}{3x+1} + \frac{(3x-1)\cancel{(3x+1)}}{3x-1} = \frac{(3x-1)\cancel{(3x+1)} \cdot 2}{3x+1}$$

$$9x-1 - (3x+1) = (3x-1)2$$

$$9x-1-3x-1 = 6x-2$$

$$9x-3x-6x = -2+2$$

$$0x = 0$$

αόριστη Άπειρες λύσεις

$$x \in \mathbb{R} - \left[-\frac{1}{3}, \frac{1}{3}\right]$$

$$9. \quad (5) \quad \frac{x-1}{x} - \frac{1}{x+1} + \frac{1}{x^2+x} = 0,$$

Πρέπει: $x \neq 0$ και $\boxed{x+1 \neq 0}$ και $\boxed{x(x+1) \neq 0}$
 $\boxed{x \neq -1}$

Πρέπει $\underline{x \neq 0}$ και $\underline{x \neq -1}$

~~$x(x+1)$~~

$$x(x+1) \cdot (x-1) - x(x+1) + x(x+1) = 0$$

$$(x^2+x) \cdot (x-1) - x^2+x + x^2+x = 0$$

$$x^3 - \cancel{x^2} + \cancel{x^2} - \cancel{x} + \cancel{x^2} + x + \cancel{x^2} + x = 0$$

$$x^3 + x = 0$$

$$x(x^2+1) = 0$$

$$x(x+1)(x-1) = 0$$

$$x+1=0 \quad \text{ή} \quad x-1=0$$

$$\boxed{x \neq -1} \quad \text{ή} \quad \boxed{x = 1} \quad \text{επαληθεύεται}$$

Απορρίπτεται

$$9. \frac{x-1}{x} - \frac{1}{x+1} + \frac{1}{x^2+x} = 0$$

$$\frac{x-1}{x} - \frac{1}{x+1} + \frac{1}{x(x+1)} = 0$$

причем $x \neq 0$ так $x+1 \neq 0$ так $x(x+1) \neq 0$

$$\bullet \boxed{x=0}$$

$$\bullet x+1=0 \Rightarrow \boxed{x=-1}$$

$$\bullet x(x+1)=0 \Rightarrow \boxed{x=0} \text{ и } \boxed{x=-1}$$

причем $x \neq 0$

$x \neq -1$

$$\in \mathbb{K} \exists x(x+1)$$

$$\cancel{x(x+1)} \frac{x-1}{\cancel{x}} - \cancel{x(x+1)} \frac{1}{\cancel{x+1}} + \cancel{x(x+1)} \frac{1}{\cancel{x(x+1)}} = 0$$

$$(x+1)(x-1) - x + 1 = 0$$

$$x^2 - 1 - x + 1 = 0$$

$$x^2 - x = 0$$

$$x(x-1) = 0$$

~~$x=0$~~ ~~$x=-1$~~
Ответ

$$9. \quad \textcircled{B} \quad \frac{1}{x+2} - \frac{4}{x^2-4} = \frac{2}{x-2}$$

$$\frac{1}{x+2} - \frac{4}{(x-2)(x+2)} = \frac{2}{x-2}$$

Προσδιορισμοί

$$\bullet x+2=0 \Rightarrow \underline{x=-2}$$

η συνή
 $x \neq 2$
 $x \neq -2$

$$\bullet (x-2)(x+2)=0 \rightarrow x-2=0 \vee x+2=0$$

$$\underline{x=2}$$

$$\underline{x=-2}$$

$$\bullet x-2=0 \Rightarrow \underline{x=2}$$

$$\in \text{ΚΝ} \text{ } \emptyset \text{ } (x-2)(x+2)$$

$$\cancel{(x-2)} \cancel{(x+2)} \cdot \frac{1}{\cancel{x+2}} - \cancel{(x-2)} \cancel{(x+2)} \frac{4}{\cancel{(x-2)} \cancel{(x+2)}} = \cancel{(x-2)} \cancel{(x+2)} \frac{2}{\cancel{x-2}}$$

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

$$x-6 = 2x+4$$

$$x-2x = 4+6$$

$$-x = 10$$

$$\underline{x = -10}$$



Επορα

Μαθημ

10

① α β γ σ ζ

② α γ

③ α γ ε ζ

④ α

⑤ α γ ε

⑥ α β δ ε

⑦ α γ

⑨ α γ ε

10 α γ ,