

Παραμετρικές εξισώσεις 1ω Βαθμύ

1. $\lambda^2(x-1) = 4(x-\lambda+1)$,

$$\sum \text{το } x \text{ ο } \lambda \text{ ο } () () x = () ()$$

$$\lambda^2 x - \lambda^2 = 4x - 4\lambda + 4$$

$$\lambda^2 x - 4x = \lambda^2 - 4\lambda + 4$$

$$(\lambda^2 - 4)x = (\lambda - 2)^2$$

$$(\lambda - 2)(\lambda + 2)x = (\lambda - 2)^2$$

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

1. Αν $\lambda = 2$ τότε $0x = 0$ Αόριστο.

2. Αν $\lambda = -2$ τότε $0x = 16$ Αδύνατο

3. Αν $\lambda \neq 2, \lambda \neq -2$ τότε $\frac{(\lambda - 2)(\lambda + 2)x}{(\lambda - 2)(\lambda + 2)} = \frac{(\lambda - 2)^2}{(\lambda - 2)(\lambda + 2)}$

$$2. \quad 3(x+3) - \lambda^2(1-x) = -3x(\lambda-1)$$

$$\cancel{3x} + 9 - \lambda^2 + \lambda^2 x = -\cancel{3x\lambda} + \cancel{3x}$$

$$\lambda^2 x + 3 \times \lambda = \lambda^2 - 9$$

$$(\lambda^2 + 3\lambda) x = \lambda^2 - 9$$

$$\boxed{\lambda(\lambda+3) x = (\lambda-3)(\lambda+3)}$$

1. Av $\lambda = 0$ τότε $0x = -9$ Αδύνατο

2. Av $\lambda = -3$ τότε $0x = 0$ Αόριστο

3. Av $\lambda \neq 0, \lambda \neq -3$ τότε

$$\frac{\cancel{\lambda(\lambda+3)}}{\cancel{\lambda(\lambda+3)}} x = \frac{(\lambda-3)\cancel{(\lambda+3)}}{\cancel{\lambda(\lambda+3)}} \quad \left(x = \frac{\lambda-3}{\lambda} \right)$$

$$3. \quad \lambda x - 3\lambda = \lambda^2 - 3x$$

$$\lambda x + 3x = \lambda^2 + 3\lambda$$

$$(\lambda + 3) \cdot x = \lambda(\lambda + 3)$$

$$1. \quad \text{Av} \quad \lambda = -3 \quad \text{тогда} \quad 0x = 0 \quad \text{любым}$$

$$2. \quad \text{Av} \quad \lambda \neq -3 \quad \text{тогда} \quad \frac{(\cancel{\lambda+3})x}{\cancel{\lambda+3}} = \frac{\lambda(\cancel{\lambda+3})}{\cancel{\lambda+3}}$$

$$\underline{\underline{x = \lambda}}$$

4.

$$4 - \lambda(\lambda - 2x) = -\lambda^2 x$$

$$4 - \lambda^2 + 2\lambda x = -\lambda^2 x$$

$$2\lambda x + \lambda^2 x = \lambda^2 - 4$$

$$(2\lambda + \lambda^2) x = (\lambda - 2)(\lambda + 2)$$

$$\lambda(2 + \lambda) x = (\lambda - 2)(\lambda + 2)$$

1. Av $\lambda = 0$ $\rightarrow 02C$ $0x = -4$ Adjust

2. Av $\lambda = -2$ $\rightarrow 02C$ $0x = 0$ Adjust

3. Av $\lambda \neq 0, \lambda \neq -2$ $\rightarrow 02C$

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

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

$$5. (\lambda^2 x - 2)(\lambda - 2) + \lambda x - (\lambda - 1)^2 = 2.$$

$$\lambda^3 x - 2\lambda^2 x - 2\lambda + 4 + \lambda x - (\lambda^2 - 2\lambda + 1) = 2$$

$$\lambda^3 x - 2\lambda^2 x - \cancel{2\lambda} + 4 + \lambda x - \lambda^2 + \cancel{2\lambda} - 1 = 2$$

$$\lambda^3 x + \lambda x - 2\lambda^2 x = \lambda^2 + 2 + 1 - 4$$

$$(\lambda^3 - 2\lambda^2 + \lambda)x = \lambda^2 - 1$$

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

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

1. Av $\lambda = 0$ $\rightarrow 0x = -1$ Asumen

2. Av $\lambda = 1$ $\rightarrow 0x = 0$ Asumen.

3. Av $\lambda \neq 0, \lambda \neq 1$ $\rightarrow$

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

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

Η εξίσωση $X^V = \alpha$

1. $X^V = \alpha^V \Rightarrow X = \alpha$
αν V περιττός

2. $X^V = \alpha^V \Leftrightarrow$

$$X = \alpha$$

ή

$$X = -\alpha$$

αν V άρτιος.

Παραδύγματα

1. $x^3 = -27$

$$x^3 = (-3)^3$$

$$\boxed{x = -3}$$

2. $16x^4 - 81 = 0$

$$16x^4 = 81$$

$$(2x)^4 = 3^4$$

$$2x = 3$$

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

$$2x = -3$$

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

$$3. (x^3 - 5)(x^3 + 5) = 0$$

$$x^3 - 5 = 0$$

$$\vee x^3 + 5 = 0$$

$$x^3 = 5$$

$$x^3 = (\sqrt[3]{5})^3$$

$$x = \sqrt[3]{5}$$

$$x^3 = -5$$

$$x^3 = (-\sqrt[3]{5})^3$$

$$x = -\sqrt[3]{5}$$

$$4. (2x - 1)^3 = -27$$

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

$$2x - 1 = -3$$

$$2x = -3 + 1$$

$$2x = -2$$

$$x = -1$$

$$5. (x^4 + 2)^4 - 81 = 0$$

$$(x^4 + 2)^4 = 81$$

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

$$x^4 + 2 = 3$$

or

$$x^4 + 2 = -3$$

$$x^4 = 1$$

$$x^4 = -5$$

$$x^4 = 1^4$$

Admissibles,

$$(x = 1)$$

$$(x = -1)$$

Εξισώσεις με απόλυτες Τιμές

1. $3|2x-5|-21=0$

$$3|2x-5|=21$$

$$|2x-5|=7$$

$$2x-5=7$$

$$2x=12$$

$$x=6$$

ή

$$2x-5=-7$$

$$2x=-2$$

$$x=-1$$

2. $\frac{9-2|2x-3|}{7}=1$

$$9-2|2x-3|=7$$

$$-2|2x-3|=7-9$$

$$-2|2x-3|=-2$$

$$|2x-3|=1$$

• $2x-3=1$ ή $2x-3=-1$

$$2x=4$$

$$x=2$$

$$2x=2$$

$$x=1$$

$$3. \quad \frac{3|x-3|}{4} = 2 + \frac{|3-x|}{2}$$

$$3|x-3| = 8 + 2|3-x|$$

$$3|x-3| = 8 + 2|x-3|$$

$$3|x-3| - 2|x-3| = 8$$

$$|x-3| = 8$$

$$x-3 = 8$$

$$\boxed{x = 11}$$

$$\text{or} \quad x-3 = -8$$

$$\boxed{x = -5}$$

$$4. |5x-20| - 14 = |12-3x|$$

$$5|x-4| - 14 = 3|4-x|$$

$$5|x-4| - 14 = 3|x-4|$$

$$5|x-4| - 3|x-4| = 14$$

$$2|x-4| = 14$$

$$|x-4| = 7$$

$$x-4 = 7 \quad \text{or} \quad x-4 = -7$$

$$x = 11$$

$$x = -3$$

$$5. \quad \frac{|x-3|}{2} + \frac{|6-2x|}{3} = 8 - \frac{|3-x|}{6}$$

$$3|x-3| + 2|6-2x| = 48 - |3-x|$$

$$3|x-3| + 2 \cdot 2|3-x| = 48 - |x-3|$$

$$3|x-3| + 4|x-3| = 48 - |x-3|$$

$$7|x-3| + |x-3| = 48$$

$$8|x-3| = 48$$

$$|x-3| = 6$$

$$x-3 = 6$$

$$x = 9$$

or

$$x-3 = -6$$

$$x = -3$$

$$6. \quad d(4, d(x, 0)) = d(d(x, 0), -3)$$

$$|4 - |x|| = ||x| + 3|$$

$$4 - |x| = |x| + 3 \quad \vee \quad 4 - \cancel{|x|} = -\cancel{|x|} - 3$$

Jawab

$$-|x| - |x| = 3 - 4$$

$$-2|x| = -1$$

$$|x| = \frac{1}{2}$$

$$x = \frac{1}{2}$$

$$x = -\frac{1}{2}$$