

# Σελ 173

$$6. \textcircled{B} \quad \underbrace{x^9 - 3x^5}_{x^5 \cdot (x^4 - 3)} + \underbrace{2x^4 - 6}_{2 \cdot (x^4 - 3)} = 0$$

$$x^5 \cdot (x^4 - 3) + 2 \cdot (x^4 - 3) = 0$$

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

$$x^4 - 3 = 0$$

$$\vee \quad x^5 + 2 = 0$$

$$x^4 = 3$$

✗

$$x^4 = \sqrt[4]{3^4}$$

$$x = \sqrt[4]{3} \quad \vee \quad x = -\sqrt[4]{3}$$

$$7. \textcircled{B} \quad (2x - 3)^2 - 5 = 0.$$

$$((2x)^2 - 2 \cdot 2x \cdot 3 + 3^2) - 5 = 0$$

$$4x^2 - 12x + 9 - 5 = 0$$

$$4x^2 - 12x + 4 = 0$$

$$\Delta = b^2 - 4ac \Rightarrow -12^2 - 4 \cdot 4 \cdot 4 \Rightarrow -144 - 64 = -208 < 0, \underline{\underline{\text{αδύνατη!}}}$$

$$(8) \underline{(x-1)}^4 - 3\underline{(x-1)} = 0.$$

$$(x-1) \left( (x-1)^3 - 3 \right) = 0$$

$$x-1=0$$

$$\boxed{x=1}$$

$$\vee (x-1)^3 - 3 = 0$$

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

$$(x-1)^3 = \sqrt[3]{3^3}$$

$$x-1 = \sqrt[3]{3}$$

$$\boxed{x = \sqrt[3]{3} + 1}$$

$$5. (1) 2x^7 = 32x^3$$

$$x^7 = 16x^3$$

$$x^7 - 16x^3 = 0$$

$$\Rightarrow x^3(x^4 - 16) = 0$$

$$x^3 = 0$$

$$\boxed{x=0}$$

$$\vee x^4 - 16 = 0$$

$$x^4 = 16$$

$$x^4 = 2^4$$

$$\boxed{x=2}$$

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

$$(52) x^5 + x^3 = 0$$

$$x^3 \cdot (x^2 + 1) = 0$$

$$x^3 = 0 \vee x^2 + 1 = 0$$

$$x = 0 \quad x = -1$$

$$\textcircled{5} \quad x^2 - 6|x| + 9 = 0,$$

$$(|x| - 3)^2 = 0$$

$$|x| - 3 = 0$$

$$|x| = 3$$

$$x - 3 = 0$$

$$x = 3$$

$$x = 3$$

$$\vee \quad x = -3$$

$$\underline{\underline{3}}$$

$$\underline{\underline{-3}}$$

$$\textcircled{52} \quad \sqrt{x^2 - 4x + 4} = (x-2)^2$$

$$\sqrt{(x-2)^2} = (x-2)^2$$

$$|x-2| = |x-2|^2$$

$$|x-2| - |x-2|^2 = 0$$

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

$$\cancel{x-2} = 0$$

$$\cancel{x} = 2$$

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

$$\textcircled{x=2}$$

$$|x-2| = 1$$

$$\textcircled{x=-1}$$

$$x-2 = 1 \quad \vee \quad \textcircled{x=3}$$

$$x-2 = -1$$

$$6. \textcircled{B} d(3x, -1) = 3 + 5x$$

$$|3x + 1| = 3 + 5x$$

$$3x + 1 = 3 + 5x$$

$$3x - 5x = 3 - 1$$

$$-2x = 2$$

$$~~x = -1~~$$

$$3x + 1 = -3 - 5x$$

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

$$8x = -7$$

$$x = -\frac{7}{8} \checkmark$$

$$\begin{aligned} \pi \in \pi \quad 3 + 5x &\geq 0 \\ 5x &\geq -3 \\ x &\geq -\frac{3}{5} \end{aligned}$$

$$14. \textcircled{B} (x-1)^2 - 3|x-1| = 0$$

$$|x-1|^2 - 3|x-1| = 0$$

$$(x-1)(-3|x-1|) = 0$$

$$x-1=0$$

$$x=1$$

$$-3(x-1)=0$$

$$-3x+3=0$$

$$-3x=-3$$

$$3x=3$$

$$x=1 \checkmark$$

6. ⑧  $d(x, 1) = x + 2$

~~0 < x + 2 < 0~~

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

$$x-1 = x+2$$

$$0x = 3 \text{ не верно}$$

или  $x+2 > 0$

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

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

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



8. ⑧  $|2x-1| = 1-2x$

$$1-2x \geq 0 \quad 1 \geq 2x$$

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

$$2x-1 = 1-2x \quad + \quad 2x-1 = -1+2x$$

~~0x = 2~~

~~не верно~~

$$\frac{4x}{4} = \frac{2}{4}$$

~~4x = 2~~

Тогда

$$x = \frac{2}{4}$$

$$x \in \mathbb{R}$$

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



$$12. \textcircled{a} \left| \frac{2-x}{x+2} \right| = 3$$

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

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

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

$$\frac{-4x-4}{-4-4} \quad x = -1$$

$$\Leftrightarrow |2-x| = 3|x+2|$$

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

$$2-x = -3x-6$$

$$\textcircled{2} -x+3x = -4$$

$$\frac{2x}{2} = \frac{-4}{2}$$

$$x = -2$$

$$13. \textcircled{b} |x-1|/|x+1| = 3$$

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

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

$$x^2-1 = 3$$

$$x^2 = 4$$

$$x = \pm 2$$

$$x = 2$$

$$\text{or } x^2-1 = -3$$

$$x^2 = -2$$

# Σε 2.168

6. (α)  $|x-2| = 2x-3$

$$2x-3 \geq 0$$

$$2x \geq 3 \quad x \geq \frac{3}{2}$$

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

$$\vee \quad x-2 = -2x+3$$

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

$$x+2x = 3+2$$

$$-x = -1$$

$$3x = 5$$

$$x = 1$$

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

8. (β)  $d(x, 5) - 5 = -x$

$$|x-5| - 5 = -x$$

$$-x+5 \geq 0$$

$$5 \geq x$$

$$|x-5| = -x+5$$

$$x-5 = -x+5$$

$$\vee \quad x-5 = x-5$$

$$2x = 10$$

$$x-x = -5+5$$

$$0x = 0$$

$$x = 5$$

Ταυτότητα

$$x \leq 5$$

$$12. \textcircled{B} \frac{|2x+1|}{|1-2x|} = 3.$$

$$|2x+1| = 3|1-2x| \Leftrightarrow$$

$$|2x+1| = |3-6x| \Leftrightarrow$$

$$2x+1 = 3-6x \quad \vee \quad 2x+1 = -3+6x$$

$$8x = 2$$

$$x = \frac{2}{8}$$

$$-4x = -4$$

$$x = 1$$

$$\textcircled{B} |3x^2-2x| = |4-6x|.$$

~~$$x|3x-2| = 2|2-3x| \Leftrightarrow$$~~

~~$$x|3x-2| = 2|3x-2| \Leftrightarrow$$~~

~~$$x|3x-2| - 2|3x-2| = 0 \Leftrightarrow$$~~

~~$$|3x-2|(x-2) = 0$$~~

~~$$|3x-2| \neq -(x-2)$$~~

$$3x^2 - 2x = 4 - 6x$$

$$3x^2 + 4x - 4 = 0$$

$$\Delta = 0000$$

$$\vee \quad 3x^2 - 2x = -4 + 6x$$

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

$$\Delta = -$$



# Aswoud

$$1. \frac{x+1}{2x-3} + \frac{x-2}{2x+3} = 1 - \frac{2(x-9)}{4x^2-9}$$

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

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

$$x \neq -\frac{3}{2}$$

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

$$2x^2 + 2x + 3x + 3 + 2x^2 - 4x - 3x + 6 = 4x^2 - 9 - 2x + 18$$

$$\cancel{4x^2} - \cancel{2x} + \cancel{9} = \cancel{4x^2} - \cancel{2x} + \cancel{9}$$

$$0 = 0 \quad \text{Tautologia.}$$

Definição de domínio

$$x \in \mathbb{R} - \left\{ \frac{3}{2}, -\frac{3}{2} \right\}.$$

$$3. \quad \frac{2|5-3x| - 1}{9} = 1$$

$$2|5-3x| - 1 = 9$$

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

$$|5-3x| = 5$$

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

$$x = 0$$

$$\vee \quad 5 - 3x = -5$$

$$10 = 3x$$

$$x = \frac{10}{3}$$

$$4. \quad \frac{|x-2|}{2} = \frac{11}{20} - \frac{|6-3x|}{5}$$

$$\frac{|x-2|}{2} = \frac{11}{20} - \frac{3|2-x|}{5}$$

$$10|x-2| = 11 - 12|x-2|$$

$$10|x-2| + 12|x-2| = 11$$

$$22|x-2| = 11$$

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

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

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

$$x = \frac{5}{2}$$

$\vee$

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

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

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

$$7. \quad | |x| - 3 | = 1$$

$$|x| - 3 = 1$$

$$|x| = 4$$

$$x = 4$$

$$x = -4$$

$$\vee \quad |x| - 3 = -1$$

$$|x| = 2$$

$$x = 2$$

$$x = -2$$

$$8. \quad d(d(x, -2), 5) = 4$$

$$d(|x+1|, 5) = 4$$

$$| |x+1| - 5 | = 4$$

$$|x+1| - 5 = 4$$

$$|x+1| = 9$$

$$x+1 = 9$$

$$x = 8$$

$$\vee \quad x+1 = -9$$

$$x = -10$$

$$\vee \quad |x+1| - 5 = -4$$

$$|x+1| = 1$$

$$x+1 = 1 \quad \vee \quad x+1 = -1$$

$$x = 0$$

$$x = -2$$

$$9. (x^2+2)^2 = x \left( (x+1)^3 - (3x^2-x+1) \right)$$

$$x^4 + 4x^2 + 4 = x \left( x^3 + \cancel{3x^2} + 3x + 1 - \cancel{3x^2} + x - 1 \right)$$

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

$$\cancel{x^4} + \cancel{4x^2} + 4 = \cancel{x^4} + \cancel{4x^2}$$

$$4 = 0 \quad \text{Answer}$$

$$10. 2x(x^2-12) - 4(2x-1) = 4$$

$$2x^3 - 24x - 8x + 4 = 4$$

$$2x^3 - 24x - 8x = 0$$

$$2x^3 - 32x = 0$$

$$2x(x^2-16) = 0$$

$$2x = 0 \quad \text{or} \quad x^2 - 16 = 0$$

$$x = 0$$

$$(x-4)(x+4) = 0$$

$$x-4 = 0 \quad \text{or} \quad x+4 = 0$$

$$x = 4$$

$$x = -4$$

# Επονομα Μαθημα

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Σελ 168

⑥ γ

⑧ α.

⑨.

Σελ 169

⑬ α β.

⑭ α γ c

⑰.