4. (δ)

Ενότητα 18

$x^4 - 3x^3 + 6x - 4 = 0$

-4

$\pm 1 \ \pm 2 \ \pm 4$

1	-3	0	6	-4	(1)
↓	1	-2	-2	4	
1	-2	-2	4	0	

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

$x - 1 = 0$ ή $x^3 - 2x^2 - 2x + 4 = 0$

$\boxed{x = 1}$

1	-2	-2	4	(2)
↓	2	0	-4	
1	0	-2	0	

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

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

19. $\left(\frac{2x}{3x-1}\right)^6 + 7\left(\frac{2x}{3x-1}\right)^3 - 8 = 0$

$\frac{2x}{3x-1} = t$

$t^6 + 7t^3 - 8 = 0$

$(t^3)^2 + 7t^3 - 8 = 0$

$t^3 = u$

$u^2 + 7u - 8 = 0$

$u = -8$

$t^3 = -8$

$t^3 = (-2)^3$

$t = -2$

$\frac{2x}{3x-1} = -2$

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

$2x = -6x + 2$

$8x = 2$

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

$u = 1$

$t^3 = 1$

$t^3 = 1^3$

$t = 1$

$\frac{2x}{3x-1} = 1$

$2x = 3x - 1$

$1 = x$

12. ⑧ $h(x) = 2x^3 + 7x^2$

$g(x) = x^4 + 8x + 12$

$h(x) = g(x)$

$2x^3 + 7x^2 = x^4 + 8x + 12$

$x^4 - 2x^3 - 7x^2 + 8x + 12 = 0$

1	−2	−7	8	12	(−1)
↓	−1	3	4	−12	
1	−3	−4	12	0	

$(x+1)(x^3 - 3x^2 - 4x + 12) = 0$

$x + 1 = 0$ ↓ $x^3 - 3x^2 - 4x + 12 = 0$

$x = -1$

$A(-1, 5)$

1	−3	−4	12	(3)
↓	3	0	−12	
1	0	−4	0	

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

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

$B(3, 117)$

11. ⓑ $f(x) = x^3 - 6x$

$g(x) = x - 6$

Κοινα σημεια.

$$f(x) = g(x)$$

$$x^3 - 6x = x - 6$$

$$x^3 - 6x - x + 6 = 0$$

$$x^3 - 7x + 6 = 0$$

1	0	−7	6	(1)
↓	1	1	−6	
1	1	−6	0	

$$(x-1)(x^2+x-6) = 0$$

$x - 1 = 0$ ή $x^2 + x - 6 = 0$

$x = 1$ $\quad x = -3$ $\quad x = 2$

$A(1, -5)$ $\quad B(-3, -9)$ $\quad \Gamma(2, -4)$

10. (B) $f(x) = x^3 - 2x^2 - 5x + 6$

$x'x$

$f(x) = 0$

$$x^3 - 2x^2 - 5x + 6 = 0$$

1	−2	−5	6	(1)
↓	1	−1	−6	
1	−1	−6	0	

$$(x-1)(x^2 - x - 6) = 0$$

$x - 1 = 0$ ή $x^2 - x - 6 = 0$

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

$A(1, 0)$ $B(3, 0)$ $\Gamma(-2, 0)$

8. (B) $\frac{2}{15}x^3+\frac{1}{3}x^2-\frac{4}{15}x-\frac{1}{5}=0$

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

2	5	−4	−3	(1)
↓	2	7	3	
2	7	3	0	

$(x-1)(2x^2+7x+3)=0$

$x-1=0$ sau $2x^2+7x+3=0$

$\Delta=49-24=25$

$x=1$

$x=\frac{-7\pm5}{4}$ → $-\frac{1}{2}$, -3

9. (B) $x^9+x^6-2=0$

$(x^3)^3+(x^3)^2-2=0$ $\quad x^3=t$

$t^3+t^2-2=0$

1	1	0	−2	(1)
↓	1	2	2	
1	2	2	0	

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

$t-1=0$ sau $t^2+2t+2=0$

$\Delta<0$

$t=1$

$x^3=1 \Rightarrow x^3=1^3$

$x=1$

6.

(B) $2x^3 - x - 1 = 0$

2	0	-1	-1	(1)
↓	2	2	1	
1	2	1	0	

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

$x - 1 = 0$ și $2x^2 + 2x + 1 = 0$

$\Delta < 0$

$x = 1$

(8) $x^3 + 3 = 2x(1-x)$.

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

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

1	2	-2	3	(-3)
↓	-3	3	-3	
1	-1	1	0	

$(x+3)(x^2 - x + 1) = 0$

$x + 3 = 0$ și $x^2 - x + 1 = 0$

$x = -3$ $\quad \Delta < 0$.

Εποχιακή Μαθηματικά

17

46

49

54

18

2 α γ c

3 α

4 α γ

6 α γ

7 α

8 α.

9

10 α γ

11 α

12 α.