5.12 1)

Πρέπει $\lim\limits_{x\to 2^-} f(x) = \lim\limits_{x\to 2^+} f(x) \Rightarrow \lim\limits_{x\to 2^-}\left(4x^2+x+3\lambda\right) = \lim\limits_{x\to 2^+}\left(2\lambda x-3\right) \Rightarrow$

$4\cdot 2^2+2+3\lambda = 2\lambda\cdot 2-3 \Rightarrow 18+3\lambda = 4\lambda-3 \Rightarrow \boxed{\lambda = 21}$

5.12 2)

Πρέπει $\lim\limits_{x\to -3^-} f(x) = \lim\limits_{x\to -3^+} f(x) \Rightarrow \lim\limits_{x\to -3^-}\left(\lambda x^2-x+1\right) = \lim\limits_{x\to -3^+}\left(x^2-2x+3\lambda\right) \Rightarrow$

$\Rightarrow \lambda(-3)^2-(-3)+1 = (-3)^2-2(-3)+3\lambda \Rightarrow 9\lambda+3+1 = 9+6+3\lambda \Rightarrow$

$\Rightarrow 6\lambda = 11 \Rightarrow \boxed{\lambda = \frac{11}{6}}$

5.12 3)

Πρέπει $\lim\limits_{x\to 1^-} f(x) = \lim\limits_{x\to 1^+} f(x) \Rightarrow \lim\limits_{x\to 1^-}\left(\lambda x^2-x+2\right) = \lim\limits_{x\to 1^+}\left(3\lambda x-1\right) \Rightarrow$

$3\lambda\cdot 1-1 = \lambda^2\cdot 1^2-1+2 \Rightarrow \lambda^2+1 = 3\lambda-1 \Rightarrow \lambda^2-3\lambda+2 = 0 \Rightarrow$

$\Delta = 9-8 = 1$, $\lambda_{1,2} = \frac{3\pm\sqrt{1}}{2\cdot 1} = \frac{3\pm 1}{2} \Rightarrow \begin{cases} \lambda_1 = \frac{3-1}{2} = 1 \\ \lambda_2 = \frac{3+1}{2} = 2 \end{cases}$

$\Rightarrow$ $\boxed{\lambda = 1}$ ή $\boxed{\lambda = 2}$

5.12 4)

Πρέπει $\lim\limits_{x\to -2^-} f(x) = \lim\limits_{x\to -2^+} f(x) \Rightarrow \lim\limits_{x\to -2^-}\left(3\lambda x+2\right) = \lim\limits_{x\to -2^+}\left(\lambda x^2-\lambda x+3\right) \Rightarrow$

$\Rightarrow 3\lambda(-2)+2 = \lambda(-2)^2-\lambda(-2)+3 \Rightarrow -6\lambda+2 = 4\lambda+2\lambda+3 \Rightarrow$

$\Rightarrow -1 = 12\lambda \Rightarrow \boxed{\lambda = -\frac{1}{12}}$

5.12 5)

Πρέπει $\lim\limits_{x\to 1^-} f(x) = \lim\limits_{x\to 1^+} f(x) \Rightarrow \lim\limits_{x\to 1^-}\left(x+1\right) = \lim\limits_{x\to 1^+}\left(3-\lambda x^2\right) \Rightarrow$

$\Rightarrow 1+1 = 3-\lambda\cdot 1^2 \Rightarrow 2 = 3-\lambda \Rightarrow \boxed{\lambda = 1}$

5.12 6)

Πρέπει $\lim\limits_{x\to 2^-} f(x) = \lim\limits_{x\to 2^+} f(x) \Rightarrow \lim\limits_{x\to 2^-}\left(2\lambda^2 x+5\right) = \lim\limits_{x\to 2^+}\dfrac{\lambda^2x^2+\lambda x-1}{2x-3} \Rightarrow$

$\Rightarrow 2\lambda^2\cdot 2+5 = \dfrac{\lambda^2\cdot 2^2+\lambda\cdot 2-1}{2\cdot 2-3} \Rightarrow \cancel{4\lambda^2}+5 = \cancel{4\lambda^2}+2\lambda-1 \Rightarrow -2\lambda = -6 \Rightarrow \boxed{\lambda = 3}$