

20. Решите уравнение $\frac{1}{(x-4)^2} - \frac{7}{x-4} + 10 = 0$.

$$\frac{1}{(x-4)^2} - \frac{7}{x-4} + 10 = 0$$

$$\frac{1}{(x-4)^2} - \frac{7(x-4)}{(x-4)^2} + \frac{10(x-4)^2}{(x-4)^2} = 0$$

$$(1 - 7(x-4) + 10(x-4)^2) / (x-4)^2 = 0$$

$$(1 - 7(x-4) + 10(x-4)^2) = 0 \quad (x-4)^2 \neq 0$$

$$1 - 7(x-4) + 10(x^2 - 8x + 16) = 0$$

$$1 - 7x + 28 + 10x^2 - 80x + 160 = 0$$

$$189 - 87x + 10x^2 = 0$$

$$10x^2 - 87x + 189 = 0$$

$$a=10 \ b=-87 \ c=189$$

$$b^2 - 4ac$$

$$D=(-87)^2 - 4 \cdot 10 \cdot 189 = 7569 - 4 \cdot 10 \cdot 189 = 7569 - 7560 = 9$$

$$\sqrt{D}=3$$

$$x_1 = (-b + \sqrt{D}) / (2a)$$

$$x_2 = (-b - \sqrt{D}) / (2a)$$

$$x_1 = (-(-87) + 3) / (2 \cdot 10) = 90 / 20 = 45 / 10 = 4,5$$

$$x_2 = (-(-87) - 3) / (2 \cdot 10) = 84 / 20 = 42 / 10 = 4,2$$

$$\begin{aligned}(x-4)^2 &= (x-4) \cdot (x-4) = (x-4) \cdot x + (x-4) \cdot (-4) = \\&= x^2 - 4x - 4x + 16 = x^2 - 8x + 16\end{aligned}$$

$$\begin{array}{ccc} 87 & & 189 \\ 87 & & 40 \\ 609 & & 000 \\ 696 & & 756 \\ 7569 & & 7560 \end{array}$$

Ответ: 4,5 ; 4,2.