

Lektion 11b - genomgång av duggan

1a

$$\begin{aligned}
 3x^2 - 3x + 1 &= 3\left(\overline{x^2 - x} + \frac{1}{3}\right) \\
 &= 3\left(\overline{(x - \frac{1}{2})^2 - \frac{1}{4}} + \frac{1}{3}\right) = 3\left((x - \frac{1}{2})^2 - \frac{3}{12} + \frac{4}{12}\right) \\
 &\quad \text{X}^2 - x + \frac{1}{9} \\
 &= 3\left((x - \frac{1}{2})^2 + \frac{1}{12}\right) = 3(x - \frac{1}{2})^2 + \frac{1}{4} \quad \leftarrow \text{Svar}
 \end{aligned}$$

1b

$$\frac{x^4 - x^3 + 2}{x^2 - 3} \quad \text{bestäm krot och rest}$$

$$\begin{array}{r}
 \begin{array}{c} x^2 - x + 3 \\ \hline x^2 - 3 \end{array} \left[\begin{array}{r} x^4 - x^3 + 2 \\ - (x^4 \quad - 3x^2) \\ \hline -x^3 + 3x^2 + 2 \\ - (-x^3 \quad + 3x) \\ \hline 3x^2 - 3x + 2 \\ - (3x^2 \quad - 9) \\ \hline -3x + 11 \end{array} \right]
 \end{array}$$

Krot: $x^2 - x + 3$

Rest: $-3x + 11$

2a

$$y_1 = 3x + 2 \quad \text{Finn } x \text{ så att avståndet } < 1$$

$$y_2 = 5 - x$$

$$|z| < b$$

$$-b < z < b$$

$$|y_1 - y_2| < 1$$

$$|3x + 2 - (5 - x)| < 1$$

$$|3x + 2 - 5 + x| < 1$$

$$|4x - 3| < 1$$

$$-1 < 4x - 3 < 1$$

$$3 - 1 < 4x < 1 + 3$$

$$2 < 4x < 4$$

$$\frac{2}{4} < x < 1$$

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

Svar!!

2b

$$3 \ln x + \ln(x-1) = \ln(2-x) + 2 \ln x$$

Subtrahieren $2 \ln x$

$$\ln x + \ln(x-1) = \ln(2-x)$$

$$\ln(x(x-1)) = \ln(2-x)$$

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

$$x = \sqrt{2}$$

oder $x = -\sqrt{2}$

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

$$x^2 - 2 = 0$$

$$x^2 = 2$$

3a

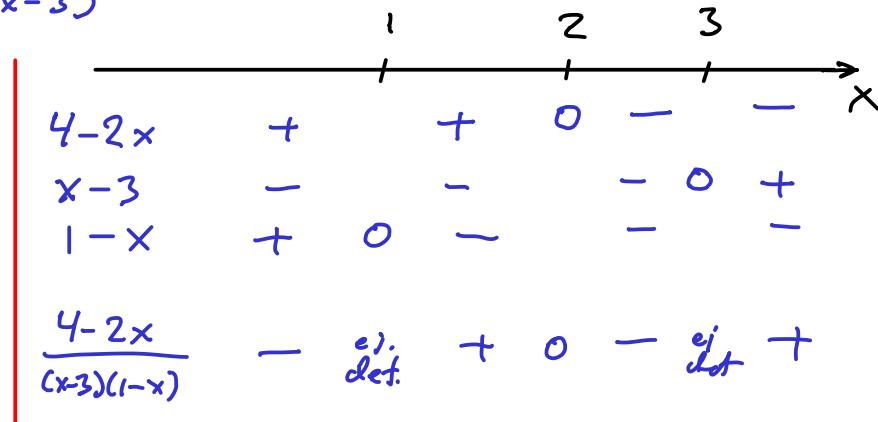
$$\frac{1}{x-3} < \frac{1}{1-x}$$

$$\frac{1}{x-3} - \frac{1}{1-x} < 0$$

$$\frac{1 \cdot (1-x)}{(x-3)(1-x)} - \frac{1 \cdot (x-3)}{(1-x)(x-3)} < 0$$

$$\frac{1-x - (x-3)}{(x-3)(1-x)} < 0$$

$$\frac{4-2x}{(x-3)(1-x)} < 0$$

 $x < 1$ oder $2 < x < 3$ $x \in]-\infty, 1[\cup]2, 3[$

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

$$|x-1| = \begin{cases} x-1 & x-1 \geq 0 \\ -(x-1) & x-1 < 0 \end{cases}$$

