

3239 Rita med hjälp av derivata grafen

**b** till  $y = \frac{x^2 + 2x + 4}{2x}$  inklusive eventuella asymptoter.

$$y = \frac{x^2 + 2x + 4}{2x}$$

$$y' = \frac{(2x+2)2x - 2(x^2 + 2x + 4)}{4x^2}$$

$$y' = \frac{4x^2 + 4x - 2x^2 - 4x - 8}{4x^2}$$

$$y' = \frac{2x^2 - 8}{4x^2} = \frac{2(x^2 - 4)}{4x^2}$$

$$y' = \frac{x^2 - 4}{x^2} = 0$$

$$x = \pm 2$$

asymptot vid  $x = 0$

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

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

$$y(2) = \frac{4 + 4 + 4}{4} = \frac{3 \cdot 4}{4} = 3 \quad \text{min} \quad (2, 3)$$

$$y(-2) = \frac{4 - 4 + 4}{-4} = -1 \quad \text{max} \quad (-2, -1)$$

$$y'' = \frac{2x \cdot x^2 - 2x(x^2 - 4)}{x^4}$$

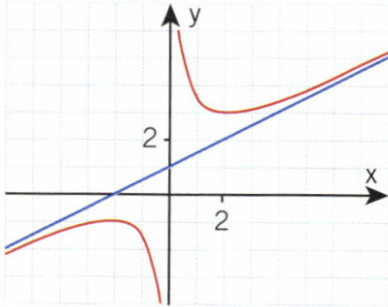
$$= \frac{2x^3 - 2x^3 + 8x}{x^4}$$

$$y'' = \frac{8}{x^3}$$

$$y''(2) = \oplus \quad \text{min}$$

$$y''(-2) = \ominus \quad \text{max}$$

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Lokalt max:  $(-2, -1)$

Lokalt min:  $(2, 3)$

Asymptoter:  $y$ -axeln och  
 $y = 0,5x + 1$