NP Ma3b ht 2012

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(a) $\dfrac{(x-3)(x+2)}{2x-6} = \dfrac{(x-3)(x+2)}{2(x-3)} = \dfrac{x+2}{2}$ (Svar)

(b) $\dfrac{x^2+8x+16}{2x^2-32} = \dfrac{x^2+2\cdot 4x+4^2}{2(x^2-16)} = \dfrac{(x+4)^2}{2(x+4)(x-4)} = \dfrac{x+4}{2(x-4)}$ (Svar)

OBS! $16=4^2$

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$\int_{-2}^{5} f(x)\,dx = F(5)-F(-2) = -2-(-1) = -1$

Avläsning i grafen ger $F(5)=-2$, $F(-2)=-1$.

Observera att grafen visar den primitiva funktionen F till integranden f'

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$$f'(x) = \lim_{h\to 0} \frac{f(x+h)-f(x)}{h}$$

$$= \lim_{h\to 0} \frac{\frac{A}{x+h} - \frac{A}{x}}{h} = \lim_{h\to 0} \frac{\frac{Ax - A(x+h)}{(x+h)x}}{h}$$

$$= \lim_{h\to 0} \frac{\frac{Ax - Ax - Ah}{(x+h)x}}{\frac{h}{1}} = \lim_{h\to 0} \frac{-A\cancel{h}}{x(x+h)} \cdot \frac{1}{\cancel{h}}$$

$$= \lim_{h\to 0} \left(-\frac{A}{x(x+h)}\right) = -\frac{A}{x\cdot x} = -\frac{A}{x^2}$$

Svar: $f'(x) = -\dfrac{A}{x^2}$