NP Ma 3c ht 2012

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

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

OBS! $16 = 4^2$

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15 $$\int_{-2}^{5} f(x)\,dx = F(5) - F(-2) = -2 - (-1) = -1$$

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

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

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16 $$f'(x) = \lim_{h\to 0} \frac{f(x+h) - f(x)}{h}$$

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

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

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

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