

Løsningsforslag 1. Innlevering Ma-017

Oppgave 1 Regn ut og skriv svaret enklest mulig.

a)

$$\begin{aligned}\left(\frac{4}{3} - \frac{6}{5}\right) : \left(\frac{1}{2} + \frac{2}{5}\right) &= \\ &= \frac{20-18}{15} \cdot \frac{10}{5+4} \\ &= \frac{2}{15} \cdot \frac{10}{9} = \frac{2}{3} \cdot \frac{2}{9} = \frac{4}{\underline{\underline{27}}}\end{aligned}$$

b)

$$\begin{aligned}\frac{\frac{4}{5} - \frac{2}{25}}{\frac{1}{10} - \frac{3}{5}} &\cdot 50 = \\ &= \frac{40-4}{5-30} = -\frac{36}{\underline{\underline{25}}}\end{aligned}$$

utvider med fellesnevner

til "smånevnerne"

$$\text{c) } \frac{3^{\frac{2}{4}} \cdot (3^{\frac{1}{6}})^3}{(3^{\frac{1}{2}})^2} = \frac{3^{\frac{1}{2}} \cdot 3^{\frac{3}{6}}}{3^1} = 3^{\frac{1}{2} + \frac{1}{2} - 1} = 3^0 = \underline{\underline{1}}$$

$$\text{e) } \sqrt{x^3} \cdot \sqrt[8]{x^2} \cdot \sqrt[4]{x} = x^{\frac{3}{2}} \cdot x^{\frac{2}{8}} \cdot x^{\frac{1}{4}} = x^{\frac{6}{4} + \frac{1}{4} + \frac{1}{4}} = x^{\frac{8}{4}} = \underline{\underline{x^2}}$$

Oppgave 2 Regn ut

$$\text{a) } (2x-1)^2 = (2x)^2 - 2 \cdot 2x \cdot 1 + 1 = \underline{\underline{4x^2 - 4x + 1}}$$

b)

$$\begin{aligned}(x-2)(x+2) + 3(x+1)(x+3) - 4x(x+3) \\ &= x^2 - 4 + 3(x^2 + 3x + x + 3) - 4x^2 - 12x \\ &= -3x^2 - 12x - 4 + 3x^2 + 12x + 9 = \underline{\underline{5}}\end{aligned}$$

Oppgave 3 Forkort brøkene Husk på at vi bare kan "forkorte bort en felles faktor".

$$\text{a) } \frac{2x+4}{4} = \frac{2(x+2)}{4} = \frac{x+2}{\underline{\underline{2}}}$$

$$\text{b) } \frac{ab-2b}{a^2b-4b} = \frac{b(a-2)}{b(a^2-4)} = \frac{1 \cdot (a-2)}{(a+2)(a-2)} = \frac{1}{\underline{\underline{a+2}}}$$

$$\text{c) } \frac{2x^2-18}{3x+9} = \frac{2(x^2-9)}{3(x+3)} = \frac{2(x+3)(x-3)}{3(x+3)} = \frac{2(x-3)}{\underline{\underline{3}}}$$

$$\text{d) } \frac{x^2-1}{x+1} = \frac{(x+1)(x-1)}{x+1} = \underline{\underline{x-1}}$$

Oppgave 4 Løs likningene ved regning

a)

$$\begin{aligned}2y + 7 &= 3y - 3 \\2y - 3y &= -3 - 7 \\-y &= -10 \quad | : -1 \\ \underline{\underline{y &= 10}}\end{aligned}$$

b)

$$\begin{aligned}\frac{3}{4}(x-2) + \frac{2}{3} &= x - \frac{x-3}{2} \quad | \cdot fn = 12 \\9(x-2) + 8 &= 12x - (x-3) \cdot 6 && \text{Pass på fortegnet foran brøken!} \\9x - 18 + 8 &= 12x - 6x + 18 \\3x &= 28 \\x &= \frac{28}{3} \\ \underline{\underline{x &= \frac{28}{3}}}\end{aligned}$$

c)

$$\begin{aligned}\frac{2}{x-2} &= \frac{5}{2x-1} \quad | \cdot fn = (x-2)(2x-1) \\2(2x-1) &= 5(x-2) \\4x - 2 &= 5x - 10 \\-x &= -8 \quad | \cdot -1 \\ \underline{\underline{x &= 8}}\end{aligned}$$

d)

$$\begin{aligned}x^2 &= -4x \\x^2 + 4x &= 0 \\x(x+4) &= 0 \\x = 0 \quad \vee \quad x &= -4 && \underline{\underline{L = \{-4, 0\}}}\end{aligned}$$

e)

$$\begin{aligned}(3t-1)(t+2) &= 3t^2 - 1 \\3t^2 + 6t - t - 2 &= 3t^2 - 1 \\5t &= 2 - 1 \\5t = 1 & \quad \left| \cdot \frac{1}{5} \right. \\ \underline{\underline{t &= \frac{1}{5}}}\end{aligned}$$

Oppgave 5

$$I: \quad 5x - 3y = 10$$

$$II: \quad \frac{x}{y} = \frac{2}{5}$$

Løser II med hensyn på x :

$$II: \quad \frac{x}{y} = \frac{2}{5} \mid \cdot y$$

$$x = \frac{2y}{5}$$

Setter inn i I:

$$5 \cdot \frac{2y}{5} - 3y = 10$$

$$2y - 3y = 10$$

$$-y = 10 \mid \cdot (-1)$$

$$\underline{y = -10} \quad \text{som gir } x = \frac{2 \cdot (-10)}{5} = -4$$

$$\text{Løsning:} \quad \underline{\underline{x = -4, y = -10}}$$