Kasper Melsing Bjørnholdt (cbht1cgf 25) –
Matematik Aflevering 4

Opgave 1

a)

$$2 \cdot 3 + 3 \cdot 2^2 - 3 \cdot \sqrt{16} = 6$$

b)

$$1 - 3^2 + \frac{10}{4} \cdot 2 + 3 \cdot 7 + 2 \cdot 4 \cdot 1 \cdot 0 + 3 = 21$$

c)

$$\sqrt{16} \cdot \sqrt{25} - \sqrt{9} \cdot 3^2 + 2 \cdot 2 - 8 = -11$$

d)

$$\frac{2 + 3 \cdot 2}{4} - 2^3 \cdot 1 + 4 \cdot 7 - 28 = -6$$

e)

$$2 \cdot (3 + 2) + (4 - 3)^2 - 5 \cdot 4 = -9$$

f)

$$-2^2 + 4 - 3 \cdot (-2)^2 + (-8) \cdot 1 + \frac{20}{-5} = -24$$

g)

$$2 \cdot (4 - 5) + 3 \cdot (2 - 4)^2 = 10$$

h)

$$-2 \cdot (-2 \cdot 4) + 3 \cdot (5 - 3) = 22$$

i)

$$\left(2 - 3^2\right) \cdot \left(3^2 - 2\right) + 7^2 + \frac{8}{6-2} = 2$$

j)

$$-1 \cdot (-1) - 1 \cdot (-1)^2 + 4 \cdot \sqrt{25} - 7 - (-8) = 21$$

k)

$$\frac{1}{2} - \frac{1}{4} + \frac{1}{8} = \frac{3}{8}$$

l)

$$\frac{2}{3} - \frac{3}{4} + \frac{5}{6} = \frac{3}{4}$$

m)

$$\frac{1}{2} + \frac{1}{3} - \frac{3}{4} - \frac{1}{6} + \frac{9}{8} = \frac{25}{24}$$

n)

$$7 \cdot \frac{2}{3} - \frac{\dfrac{2}{3}}{7} = \frac{32}{7}$$

o)

$$\frac{\dfrac{5}{4}}{3} = \frac{15}{4}$$

Opgave 2

a)

Jeg løser ligningen nedenunder

$3x - 1 = 8$

$3x - 1 + 1 = 8 + 1$

$3x = 9$

$x = 3$

b)

Jeg løser ligningen nedenunder

$4x - 1 = 8$

$4x - 1 + 1 = 8 + 1$

$4x = 9$

$\dfrac{4x}{4} = \dfrac{9}{4}$

$x = \dfrac{9}{4}$

c)

Jeg løser ligningen nedenunder

$2x + 4 = -2 - x$

$2x + 4 - 4 = -2 - x - 4$

$2x = -6 - x$

$2x + x = -x - 6 + x$

$\dfrac{3x}{3} = \dfrac{-6}{3}$

$x = -2$

d)

Jeg løser ligningen nedenunder

$9x + 2 = 3x - 7$

$9x + 2 - 2 = 3x - 7 - 2$

$9x = 3x - 9$

$9x - 3x = 3x - 9 - 3x$

$6x = -9$

$\dfrac{6x}{6} = \dfrac{-9}{6}$

$x = -\dfrac{3}{2}$

e)
Jeg løser ligningen nedenunder

$$\frac{9}{2}x - 1 = \frac{8}{3}x + 2$$

$$\frac{9}{2}x - 1 + 1 = \frac{8}{3}x + 2 + 1$$

$$\frac{9}{2}x = \frac{8}{3}x + 3$$

$$\frac{9}{2}x - \frac{8}{3x} = \frac{8}{3}x + 3 - \frac{8}{3}x$$

$$\frac{11}{6}x = 3$$

$$6 \cdot \frac{11}{6}x = 3 \cdot 6$$

$$11x = 18$$

$$\frac{11x}{11} = \frac{18}{11}$$

$$x = \frac{18}{11}$$

f)

Jeg løser ligningen nedenunder

$x^2 + x - 2 = 0$

$a = 1$
$b = 1$
$c = -2$

$D = b^2 - 4ac$

$D = 1^2 - 4 \cdot 1 \cdot (-2) = 9$

$x = \dfrac{-1 + \sqrt{9}}{2 \cdot 1} = 1$

$x = \dfrac{-1 - \sqrt{9}}{2 \cdot 1} = -2$

g)

Jeg løser ligningen nedenunder

$x^2 - 3x = 0$

$a = 1$
$b = -3$
$c = 0$

$D = b^2 - 4ac$

$D = -3^2 - 4 \cdot 1 \cdot 0 = -9$

$x = \dfrac{-3 + \sqrt{9}}{2 \cdot 1} = 0$

$x = \dfrac{-3 - \sqrt{9}}{2 \cdot 1}$

$x_1 = 0$

$x_2 = 3$

h)
Jeg løser ligningen nedenunder

$$x^2 - 25 = 0$$

$a = 1$
$b = 0$
$c = -25$

$$D = b^2 - 4\,ac$$

$$D = 1^2 - 4 \cdot 0 \cdot -25 = 100$$

$$x = \frac{-0 + \sqrt{100}}{2 \cdot 1} = 5$$

$$x = \frac{-0 - \sqrt{100}}{2 \cdot 1} = -5$$

$$x_{1 = 5}$$

$$x_2 = -5$$

i)
Jeg løser ligningen nedenunder

$$(x + 2) \cdot (x - 3) = 0$$

$$x + 2 = 0$$

$$x + 2 - 2 = 0 - 2$$

$$x - 3 = 0$$

$$x - 3 + 3 = 0 + 3$$

$$x = 3$$

$$x_1 = -2$$
$$x_2 = 3$$

j)

Jeg løser ligningen nedenunder

$$(x + 4)^2 = 0$$

$$a^2 + b^2 + 2\,ab$$

$$x^2 + 4^2 + 2 \cdot x \cdot 4 = 0$$

$$x^2 + 8\,x + 16 = 0$$

$$x = \frac{-8 + \sqrt{8^2 - 4 \cdot 1 \cdot 16}}{2 \cdot 1} = -4$$

$$x = \frac{-8 - \sqrt{8^2 - 4 \cdot 1 \cdot 16}}{2 \cdot 1} = -4$$

$$x_{1,\,2} = -4$$