



## Tímakönnun 2

Kafla 8 - 10

STÆF2AM05

Vorönn 2024

Nafn:

LAUSD

Einkunn:

1. (20%) Einfaldaðu eftirfarandi veldadæmi:

a)  $(2x^3y)^{-3} \cdot x^1 \cdot y^3$

$$2^{-3} x^{-9} y^{-3} x^1 y^3 = 2^{-3} x^{-8} y^0 = \frac{1}{8x^8}$$

b)  $\frac{a^3 b^2 c^2}{4x} : \frac{abc^2}{2^2 x} = \frac{a^3 b^2 c^2}{2^2 x} \cdot \frac{2^2 x}{a^1 b^1 c^2} = 2^{2-2} a^{3-1} b^{2-1} c^{2-2} x^{1-1} = \underline{\underline{a^2 b}}$

2. (20%) Einfaldaðu eftirfarandi rötardæmi:

a)  $\sqrt[5]{x^3} \cdot \sqrt[3]{x^2} : \sqrt[4]{x^7}$

$$\cancel{x^{\frac{3 \cdot 12}{5 \cdot 12}}} \cdot \cancel{x^{\frac{2 \cdot 20}{3 \cdot 20}}} : \cancel{x^{\frac{7 \cdot 15}{4 \cdot 15}}} = x^{\frac{36+40-105}{60}} = \underline{\underline{x^{-\frac{29}{60}}}}$$

b)  $\sqrt{125} - \sqrt{45} - \sqrt{80}$

$$= \sqrt{25 \cdot 5} - \sqrt{9 \cdot 5} - \sqrt{16 \cdot 5}$$

$$= \sqrt{25} \cdot \sqrt{5} - \sqrt{9} \cdot \sqrt{5} - \sqrt{16} \cdot \sqrt{5}$$

$$= 5\sqrt{5} - 3\sqrt{5} - 4\sqrt{5} = \underline{\underline{-2\sqrt{5}}}$$

3. (45%) Leystu eftirfarandi annars stigs jöfnur:

a)  $3x^2 = 27$

$$\left. \begin{aligned} 3x^2 - 27 &= 0 \\ 3(x^2 - 9) &= 0 \\ 3(x+3)(x-3) &= 0 \end{aligned} \right\} \text{PÄTTUN}$$

$x_1 = -3$

$x_2 = 3$

b)  $-x^2 + 7x + 6 = 0$

$$\left. \begin{aligned} A &= -1 \\ B &= 7 \\ C &= 6 \\ D &= 73 \end{aligned} \right\} \begin{aligned} D &= B^2 - 4 \cdot A \cdot C \\ D &= 7^2 - 4 \cdot (-1) \cdot 6 \\ D &= 49 + 24 \\ D &= 73 \end{aligned}$$

$x_1 = \frac{-B + \sqrt{D}}{2 \cdot A} = \frac{-7 + \sqrt{73}}{2 \cdot (-1)} = \underline{\underline{-0,772}}$

$x_2 = \frac{-B - \sqrt{D}}{2 \cdot A} = \frac{-7 - \sqrt{73}}{2 \cdot (-1)} = \underline{\underline{7,772}}$

c)  $2x^2 + 12x = 14$

$2x^2 + 12x - 14 = 0$

$2(x^2 + 6x - 7) = 0$

$2(x+7)(x-1) = 0$

$x_1 = -7$

$x_2 = 1$

4. (15%) Summa tveggja jákvæðra talna er 56 og margfeldi þeirra er 741,75. Settu upp annars stigs jöfnu og leystu með hjálp lausnarforms fyrir annars stigs jöfnu.

$x \cdot y = 741,75$

$x + y = 56$

$x(56 - x) = 741,75$

$y = 56 - x$

$56x - x^2 - 741,75 = 0$

$$\left. \begin{aligned} A &= -1 \\ B &= 56 \\ C &= -741,75 \\ D &= 169 \end{aligned} \right\} \left. \begin{aligned} D &= B^2 - 4 \cdot A \cdot C \\ D &= 56^2 - 4 \cdot (-1) \cdot (-741,75) \\ D &= 3136 - 2967 \\ D &= 169 \end{aligned} \right\} \left. \begin{aligned} x_1 &= \frac{-B + \sqrt{D}}{2 \cdot A} = \frac{-56 + \sqrt{169}}{2 \cdot (-1)} = \frac{-56 + 13}{-2} = \frac{-43}{-2} = \underline{\underline{21,5}} \\ x_2 &= \frac{-B - \sqrt{D}}{2 \cdot A} = \frac{-56 - \sqrt{169}}{2 \cdot (-1)} = \frac{-56 - 13}{-2} = \frac{-69}{-2} = \underline{\underline{34,5}} \end{aligned} \right\}$$

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## Formúlublað

Aðgreinir:

$$D = B^2 - 4 \cdot A \cdot C$$

$$\text{Lausnir: } x_1 = \frac{-B + \sqrt{D}}{2A}$$

$$x_2 = \frac{-B - \sqrt{D}}{2A}$$

Veldar- og rótarreglur:

i.  $a^n \cdot a^m = a^{n+m}$

ii.  $a^n : a^m = a^{n-m}$

iii.  $a^n \cdot b^n = (a \cdot b)^n$

iv.  $a^n : b^n = (a : b)^n$

v.  $(a^n)^m = a^{n \cdot m}$

$$a^{-n} = \frac{1}{a^n}, \quad a^0 = 1 \quad \sqrt[q]{a^p} = a^{\frac{p}{q}} \quad \sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$$