Prva školska zadaća - ISPRAVAK
(WD)

1. Skrati razlomke

A. $\dfrac{a^{2n}-4a^n+4}{a^n-2}$ B. $\dfrac{x^{2n}+6x^n+9}{x^n+3}$

1. **Rješenje:**

a)

$$\begin{aligned}\frac{a^{2n}-4a^n+4}{a^n-2} &= \frac{\left(a^n\right)^2-2\cdot a^n\cdot 2+2^2}{a^n-2}\\ &= \frac{\left(a^n-2\right)^2}{a^n-2}=a^n-2\end{aligned}$$

b)

$$\begin{aligned}\frac{x^{2n}+6x^n+9}{x^n+3} &= \frac{\left(x^n\right)^2+2\cdot x^n\cdot 3+3^2}{x^n+3}\\ &= \frac{\left(x^n+3\right)^2}{x^n+3}=x^n+3\end{aligned}$$

2. Za polinome

A: $P(x)=3x^2-2x-2$ i $Q(x)=-x^2-2x+1$
B. $P(x)=-2x^2+3x-2$ i $Q(x)=2x^2-2x-1$

Example 1 *odredi*

$$P(x)+Q(x), P(x)-Q(x) P(x)\cdot Q(x)$$

Rješenje:

A.

$$\begin{aligned}P(x)+Q(x) &= 3x^2-2x-2-x^2-2x+1=2x^2-4x-1\\ P(x)-Q(x) &= 3x^2-2x-2-\left(-x^2-2x+1\right)\\ &= 3x^2-2x-2+x^2+2x-1=4x^2-3\\ P(x)\cdot Q(x) &= \left(3x^2-2x-2\right)\left(-x^2-2x+1\right)\\ &= -3x^4-6x^3+3x^2+2x^3+4x^2-2x+2x^2+4x-2\\ &= -3x^4-4x^3+9x^2+2x-2\end{aligned}$$

B.

$$\begin{aligned} P(x)+Q(x) &= -2x^2+3x-2+2x^2-2x-1=x-3 \\ P(x)-Q(x) &= -2x^2+3x-2-\left(2x^2-2x-1\right) \\ &= -2x^2+3x-2-2x^2+2x+1=-4x^2+5x-1 \\ P(x)\cdot Q(x) &= \left(-2x^2+3x-2\right)\left(2x^2-2x-1\right) \\ &= -4x^4+4x^3+2x^2+6x^3-6x^2-3x-4x^2+4x+2 \\ &= -4x^4+10x^3-8x^2+x+2 \end{aligned}$$

3. Kvadriraj binome

A. **a)** $\left(\frac{1}{2}a-\frac{3}{4}b\right)^2$; **b)** $3(a+2)^2-27$

B. **a)** $\left(\frac{2}{3}x-\frac{3}{2}y\right)^2$; **b)** $2(x+3)^2-32$

Rješenje: **A.**

$$\left(\frac{1}{2}a-\frac{3}{4}b\right)^2=\frac{1}{4}a^2-\frac{3}{4}ab+\frac{9}{16}b^2$$

$$\begin{aligned} 3(a+2)^2-27 &= 3\left[(a+2)^2-9\right]=3(a+2-3)(a+2+3) \\ &= 3(a-1)(a+5) \end{aligned}$$

B.

$$\left(\frac{2}{3}x-\frac{3}{2}y\right)^2=\frac{4}{9}^2-2xy+\frac{9}{4}y^2$$

$$\begin{aligned} 2(x+3)^2-32 &= 2\left[(x+3)^2-16\right]=2(x+3-4)(x+3+4) \\ &= 2(x-1)(x+7) \end{aligned}$$

4. Kuiraj binome

A. a) $(2a+b)^3$; **b)** $8x^3-27y^3$

B. a) $(x-2y)^3$; **b)** $27a^3+8b^3$

Rješenje:

A.

$$(2a-b)^3 = 8a^3 - 12a^2b + 6ab^2 - b^3$$
$$8x^3 - 27y^3 = (2x-3y)\left(4x^2 - 6xy + 9y^2\right)$$

B.

$$(x-2y)^3 = x^3 - 6x^2y + 12xy^2 - 8x^3$$
$$27a^3 + 8b^3 = (3a+2b)\left(9a^2 - 6ab + 4b^2\right)$$

5. Zbroji algebarske razlomke i dobiveni rezultat skrati:

A. $\left(a+b-\dfrac{2ab}{a+b}\right) : \left(\dfrac{a-b}{a+b}+\dfrac{b}{a}\right)$

B. $\left(\dfrac{a}{a+1}-\dfrac{a^2}{a^2-1}\right) : \left(\dfrac{a^2}{a+1}-\dfrac{a^3}{a^2+2a+1}\right)$

Rješenje:

A.

$$\left(a+b-\frac{2ab}{a+b}\right) : \left(\frac{a-b}{a+b}+\frac{b}{a}\right) = \frac{(a+b)^2-2ab}{a+b} : \frac{a(a-b)+b(a+b)}{a(a+b)}$$
$$= \frac{a^2+2ab+b^2-2ab}{a+b} : \frac{a^2-ab+ab+b^2}{a(a+b)}$$
$$= \frac{a^2+b^2}{a+b} \cdot \frac{a(a+b)}{a^2+b^2} = a$$

B.

$$\left(\frac{a}{a+1}-\frac{a^2}{a^2-1}\right) : \left(\frac{a^2}{a+1}-\frac{a^3}{a^2+2a+1}\right) = \frac{a(a-1)-a^2}{(a-1)(a+1)} : \frac{a^2(a+1)-a^3}{(a+1)^2}$$
$$= \frac{a^2-a-a^2}{(a-1)(a+1)} : \frac{a^3+a^2-a^3}{(a+1)^2}$$
$$= \frac{-a}{(a-1)(a+1)} \cdot \frac{(a+1)^2}{a^2}$$
$$= -\frac{a+1}{a(a-1)}$$