

3. KONTROLNA NALOGA (1. letnik)

2. 2. 2024

Čas pisanja: 45 minut

Uporaba žepnega računalnika ni dovoljena!

Obvezna uporaba geometrijskega orodja.

Jakov Šlaberner, 7.a

ime in priimek, razred

Zbrano število točk: $29\frac{1}{2}/32T$

Ocena:

5

Kriterij: 89% - 100% od(5), 76% - 88% pd(4), 62% - 75% db(3), 50% - 61% zd(2), do 50% nzd(1)

1. Z uporabo Evklidovega algoritma izračunaj največji skupni delitelj števil 270 in 435.

Izračunaj še najmanjši skupni večkratnik obeh števil, ne da bi števili razstavil na produkt praštevilskih potenc.

5/5T

$$D(270, 435) = 75 \quad v(270, 435) = 7830$$

$$\begin{array}{r} 435 \cdot 18 \\ 4350 \\ + 3480 \\ \hline 7830 \end{array}$$

$$\begin{array}{r} 435 \cdot 18 \\ 4350 \\ 4350 \\ \hline 7830 \end{array}$$

$$435 = 1 \cdot 270 + 165$$

$$270 = 1 \cdot 165 + 105$$

$$165 = 1 \cdot 105 + 60$$

$$105 = 1 \cdot 60 + 45$$

$$60 = 1 \cdot 45 + 15$$

$$45 = 3 \cdot 15 + 0$$

$$\begin{array}{r} 435 \\ - 270 \\ \hline 165 \end{array} \quad \begin{array}{r} 270 \\ - 165 \\ \hline 105 \end{array}$$

$$\frac{270:15=18}{120}$$

$$270 \cdot 435 = 75 \cdot v$$

$$15 \cdot 18 \cdot 435 = 75 \cdot v / : 15$$

$$v = 18 \cdot 435 = 7830$$

2. Določi največji skupni delitelj D in najmanjši skupni večkratnik v naslednjih treh izrazov:

6/6T

$$6x^4 + 48x \quad 6x(x^3 + 8) = 2 \cdot x \cdot (x+2)(x^2 - 2x + 4) \cdot 3 \cdot 2 \cdot x$$

$$8x^3 + 32x^2 + 32x \quad 8x(x^2 + 4x + 4) = 2^3 \cdot x \cdot (x+2)^2$$

$$12x^4 + 12x^3 - 24x^2 \quad 12x^2(x^2 + x - 2) = 3 \cdot 2^2 \cdot x^2 \cdot (x+2)(x-1)$$

$$D = 2 \cdot x \cdot (x+2)$$

$$v = (x^2 - 2x + 4) \cdot 3 \cdot (x+2)^2 \cdot (x-1) \cdot 2^3 \cdot x^2$$

3. Določi naravni števili a in b tako, da bo njun največji skupni delitelj 6, najmanjši skupni večkratnik pa 2016. Zapiši vse možnosti.

$4\frac{1}{2}$ /5T

$$D(a, b) = 6$$

$$\frac{2016 \cdot 6}{12096}$$

~~3273~~

$$v(a, b) = 2016$$

$$a \cdot b = D(a, b) \cdot v(a, b) = 6 \cdot 2016 = 12096$$

$$a = 6 \cdot k$$

$$b = 6 \cdot l$$

$$36 \cdot k \cdot l = 12096 / : 36$$

$$k \cdot l = 336$$

k in l kupa
3f.

$$\frac{12096 : 36 = 336}{129 \quad 216}$$

$$a \cdot b = 12096$$

$$b \cdot a = 12096$$

Na dodatnem listu

$$\begin{array}{r} 2016 \cdot 6 \\ + 12096 \\ \hline 32256 \end{array}$$

4. Decimalna števila zapiši z ulomkom in natančno izračunaj vrednost izraza. Rezultat zapiši z okrajšanim ulomkom.

5 /5T

$$1,75 + (3, \overline{18})^0 \cdot \left(\frac{3^5}{9^2}\right)^{-1} - 0,6 - \frac{15}{36} - 0,8\overline{3} =$$

3 9 27 81

$$= \frac{7}{4} + \frac{1}{3^5} - \frac{2}{3} - \frac{5}{12} - \frac{5}{6} =$$

$$\frac{27 \cdot 3}{81}$$

$$a = 0,6$$

$$= \frac{7}{4} + \frac{1}{243} - \frac{2}{3} - \frac{5}{12} - \frac{5}{6} =$$

$$10a = 6,6$$

$$9a = 6$$

$$a = \frac{6}{9} = \frac{2}{3}$$

$$\frac{81 \cdot 3}{243}$$

$$= \frac{27 \cdot 4 - 8 - 5 - 10}{72} = \frac{2}{72} =$$

$$b = 0,8\overline{3}$$

$$10b = 8,3$$

$$100b = 83,3$$

$$90b = 75$$

$$b = \frac{75}{90} = \frac{5}{6}$$

$$= \frac{1}{6}$$

5. Poenostavi izraz in zapiši, pri kateri vrednosti števila x ulomek v rezultatu ni definiran:

$$\left(\frac{x-5}{x^2-9} - \frac{6}{x^2+3x} \right) : \frac{x^2+3x-10}{x^2-3x} =$$

/5T

↓ a | b | Š | (a)erne, 1. a

3.

$$\frac{36 \cdot 6}{96}$$

$$\frac{112 \cdot 6}{672}$$

$$k \cdot l = 336$$

k	l	a	b	
112 ✓	3 ✓	672	18	✓
27 ✓	16 ✓	126	96	✓
48 ✓	7 ✓	288	42	✓
14 ✓	336	...	...	

$$\begin{array}{r} 336 \overline{) 3} \\ 112 \overline{) 2} \\ 56 \overline{) 2} \\ 28 \overline{) 2} \\ 14 \overline{) 2} \\ 7 \overline{) 7} \end{array}$$

~~288~~

$$\begin{aligned} 1126 &= 1 \cdot 96 + 30 \\ 96 &= 3 \cdot 30 + 6 \\ 30 &= 5 \cdot 6 + 0 \end{aligned}$$

$$\begin{array}{r} 48 \quad 7 \\ 112 \quad 3 \\ 27 \quad 16 \end{array}$$

$$\frac{48 \cdot 6}{288}$$

$$\frac{112 \cdot 6}{672}$$

✓ 5. Poenostavi izraz in zapiši, pri kateri vrednosti števila x ulomek v rezultatu ni definiran: 4/5T

$$\left(\frac{x-5}{x^2-9} - \frac{6}{x^2+3x} \right) : \frac{x^2+3x-10}{x^2-3x} =$$

Hodg.

$$= \left(\frac{x-5}{(x+3)(x-3)} - \frac{6}{x(x+3)} \right) : \frac{(x+5)(x-2)}{x(x-3)} =$$

$$\frac{336}{= \left(\frac{(x-5)(x) - (6) \cdot (x-3)}{(x+3)(x-3)(x)} \right) \cdot \frac{x(x-3)}{(x+5)(x-2)} =}$$

$$= \left(\frac{(x^2 - 5x) - (6x - 18)}{(x+3)(x-3)(x)} \right) \cdot \frac{x(x-3)}{(x+5)(x-2)} =$$

$$= \left(\frac{x^2 - 5x - 6x + 18}{(x+3)(x-3)(x)} \right) \cdot \frac{x(x-3)}{(x+5)(x-2)} =$$

$$= \frac{(x-9)(x-2)(x)(x-3)}{(x+3)(x-3)(x)(x+5)(x-2)} =$$

$$= \frac{x-9}{(x+3)(x+5)} \quad \checkmark$$

$$\begin{aligned} x^2 - 11x + 18 &= \\ &= (x-9)(x-2) \end{aligned}$$

6. Poenostavi:

5 / 6T

$$\sqrt{\frac{1 - 3x^{-1} + 2x^{-2}}{1 - 4x^{-1} + 4x^{-2}}} \cdot \left(1 - \frac{2x^{n+3}}{x^{n+4} - 5x^{n+3} + 6x^{n+2}}\right)^{-1} =$$

$$= \frac{x^2 - 3x + 2}{x^2 - 4x + 4} \cdot \left(1 - \frac{2x^{n+3}}{x^{n+2}(x^2 - 5x + 6)}\right)^{-1} =$$

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

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

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

$$= \frac{(x-1)(x-3)(x-2)}{(x-2)(x-3)(x-2) - 2x} =$$

$$= \frac{(x-1)(x-3)}{(x-3)(x-2) - 2x}$$

$$= \frac{(x-1)}{(x-2)} \cdot \frac{(x-3)(x-1)}{(x-6)(x-1)} = \frac{(x-3)(x-1)}{(x-2)(x-6)}$$

$$\frac{1}{1} - \frac{2x}{(x-3)(x-2)} =$$

$$= \frac{(x-3)(x-2) - 2x}{(x-3)(x-2)} =$$

$$= \frac{x^2 - 5x + 6 - 2x}{(x-3)(x-2)} =$$

$$= \frac{x^2 - 7x + 6}{(x-3)(x-2)} = \frac{(x-6)(x-1)}{(x-3)(x-2)}$$

NAROBE
PREPISANO!