NALOGE ZA 3. LETNIK - EKSPONENTNA FUNKCIJA

Naloge[1] *so namenjene utrjevanju učne snovi in pripravi na preverjanje in ocenjevanje znanja.*

EKSPONENTNA FUNKCIJA

1. V isti koordinatni sistem nariši grafe funkcij:
   (a) $y = 4^x$ in $y = -4^x$ in $y = 4^{-x}$ in $y = -4^{-x}$
   (b) $y = 3^{x+1}$ in $y = 3^{x-1}$ in $y = -3^{x-1}$ in
   (c) $y = e^x$ in $y = -e^x$ in $y = -e^x + 2$ in $y = -e^x - 1$
   (d) $y = 5^{-x}$ in $y = 5^{-x+1}$ in $y = 5^{-x-1}$

   $\star$ V učbeniku reši naloge: 4,5, 6, 7.

2. S premiki in raztegi postopoma nariši grafe funkcij. Določi definicijsko območje, zalogo vrednosti in presečišči grafa funkcije s koordinatnima osema.
   (a) $y = -2^{x+1} - 2$
   (b) $y = 3^{x-1} + 1$
   (c) $y = -e^{x+2} - 1$
   (d) $y = \left(\frac{1}{2}\right)^{x-1} - 2$
   (e) $y = 3^{-x+1}$
   (f) $y = -\left(\frac{1}{4}\right)^{x+3} + 2$
   (g) $y = 2 \cdot 5^{x-2}$
   (h) $y = \frac{1}{2} \cdot 4^{x+1} - 1$

   $\star$ V učbeniku reši naloge: 8, 9,10, 11, 12, 13, 14, 15, 27, 28, 29.

3. Določi eksponentno funkcijo $f(x) = a^x$, ki zadošča pogoju:
   (a) $f(2) = 4$ [R: $a = 2$]
   (b) $f(-1) = 3$ [R: $a = \frac{1}{3}$]
   (c) $f(3) = -3$ [R: $a = \emptyset$]
   (d) $f\left(\frac{1}{2}\right) = 4$ [R: $a = 16$]
   (e) $f\left(\frac{2}{3}\right) = 9$ [R: $a = 27$]

[1] Pripravila Vera Orešnik, prof.

(f) $f\left(\frac{3}{2}\right) = \frac{27}{8}$ [R: $a = \frac{27}{8}$]

(g) $f\left(-\frac{5}{4}\right) = -\frac{1}{32}$ [R: $a = 16$]

(h) $f\left(\frac{1}{2}\right) = 8$ [R: $a = 64$]

(i) $f\left(\frac{4}{3}\right) = \frac{81}{16}$ [R: $a = \frac{27}{8}$]

(j) $f(0,75) = 0,125$ [R: $a = \frac{1}{16}$]

(k) $f(-1,\overline{3}) = 81$ [R: $a = \frac{1}{27}$]

4. Zapiši eksponentno funkcijo $f(x) = a^x$, katere graf gre skozi dano točko:

(a) $T(3, 64)$ [R: $a = 4$]

(b) $T\left(-\frac{3}{2}, 8\right)$ [R: $a = \frac{1}{4}$]

(c) $T\left(\frac{3}{2}, \frac{1}{27}\right)$ [R: $a = \frac{1}{9}$]

(d) $T\left(-\frac{2}{3}, 16\right)$ [R: $a = \frac{1}{64}$]

(e) $T\left(-\frac{1}{2}, \frac{4}{3}\right)$ [R: $a = \frac{9}{16}$]

$\star$ V učbeniku reši naloge: 3, 26.

EKSPONENTNE ENAČBE

5. Reši enačbe:

(a) $8^x = 1$ [R: 0]

(b) $3^{x-1} = 1$ [R: 1]

(c) $4^x = 16$ [R: 2]

(d) $5^{-x} = 125$ [R: -3]

(e) $\frac{27}{8} = (\frac{2}{3})^x$ [R: -3]

(f) $3^{-x} = \frac{1}{27}$ [R: 3]

(g) $2^x = -8$ [R: $\emptyset$]

(h) $(\frac{9}{13})^{x+3} = 1$ [R: -3]

(i) $2^{x-2} = 5^{2-x}$ [R: 2]

(j) $5^{x-4} = 6^{x-4}$ [R: 4]

(k) $8^{5-x} = 7^{x-5}$ [R: 5]

(l) $4^{2x-3} = 7^{x-1,5}$ [R: $\frac{3}{2}$]

(m) $2^{x^2-7x+12} = 1$ [R: $4; 3$]

(n) $5^{x^2-8x+12} = 1$ [R: $2; 6$]

(o) $(5^{x-1})^{x+1} = (25^x)^{\frac{x}{2}-1}$ [R: $\frac{1}{2}$]

(p) $(a^{4x-7})^{6x+8} = (a^{3x+2})^{8x-5}$ [R: $-\frac{46}{11}$]

⋆ učbeniku reši naloge: 16, 17, 18.

6. Reši enačbe:

(a) $3^{x-1} \cdot 3^{x+1} = 81$ [R: $x = 2$]

(b) $2^{x+1} \cdot 4^{x+2} \cdot 8^{x+3} = \frac{1}{16}$ [R: $x = -3$]

(c) $5^{1-2x} \cdot 5^{1+2x} = 25^x$ [R: $x = 1$]

(d) $9 \cdot 3^{x+2} = 27^x$ [R: $x = 2$]

(e) $100^{2-x} \cdot 10^{5x-3} = 1000^{2x}$ [R: $\frac{1}{3}$]

(f) $0,125^{5x} \cdot 4^{\frac{x-1}{2}} = 32$ [R: $-\frac{3}{7}$]

(g) $\frac{1}{8} \cdot 2^{2x^3-1} = 4 \cdot 2^{2+x^3}$ [R: 2]

⋆ V učbeniku reši naloge: 19.

7. Reši enačbe. Navodilo: najprej uredi enačbo,če je potrebno, nato izpostavi potenco z najmanjšim eksponentom.

(a) $4^x + 4^{x+1} = 5^{x+1}$ [R: $x = 0$]

(b) $2^{x+1} - 2^{x-1} = 12$ [R: $x = 3$]

(c) $3^{x+2} - 5 \cdot 3^x - 7 \cdot 3^{x-1} = 5$ [R: $x = 1$]

(d) $2^x + 2^{x+1} + 2^{x+2} = 7^{x-2} + 7^{x-1}$ [R: $x = 3$]

(e) $7 \cdot 2^{x-3} + 4 \cdot 3^{x-2} = 3^x - 2^x$ [R: $x = 3$]

(f) $7 \cdot 3^{x+1} - 5^{x+2} = 3^{x+4} - 5^{x+3}$ [R: $x = -1$]

(g) $3 \cdot 2^{3x-4} + 125^{x-1} = 8^{x-1} + 30 \cdot 5^{3x-5}$ [R: $x = \frac{4}{3}$]

(h) $3^{2x} + 5 \cdot 3^{2x-2} - 4 \cdot 3^{2x-1} = 18$ [R: $x = 2$]

⋆ V učbeniku reši naloge: 21.

8. Reši enačbe z uvedbo nove neznanke:

(a) $3^{2x} - 10 \cdot 3^x + 9 = 0$ [R:$0; 2$]

(b) $2^{2x-1} - 3 \cdot 2^x - 8 = 0$ [R:3]

(c) $3^{2x-1} - 4 \cdot 3^{x-1} + 1 = 0$ [R:$0; 1$]

9. Enačbe reši grafično in naredi preizkus:

(a) $2^{-x-1} = 2$ [$x = -2$]

(b) $3^x = (x-1)^2 + 3$ [$x = 1$]

(c) $2^x = -2x + 4$ $[x = 1]$

(d) $5^{x-1} = 4x - 3$ $[x = 1; x = 2]$

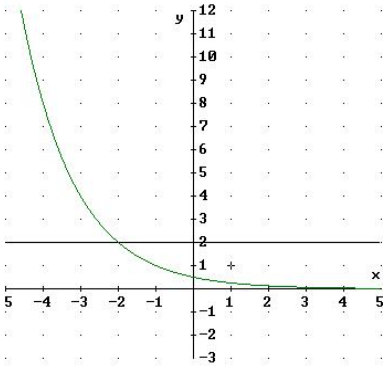
(e) $0,5^x = -1,5x + 1$ $[x = 0]$

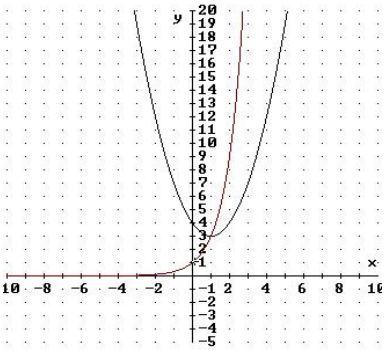
(f) $3^{x-1} = 2 - x$ $[x = 1]$

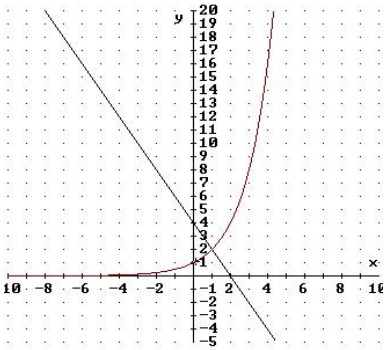
(g) $-4^{-x} = -(x + 1)^2 - 4$ $[x = -1]$

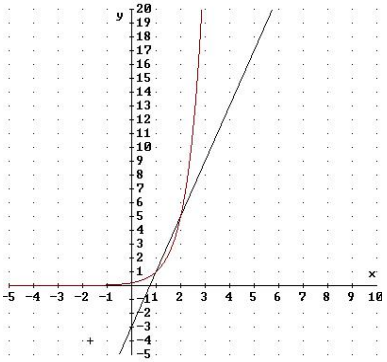
$\star$ V učbeniku reši naloge: 23, 24, 25.

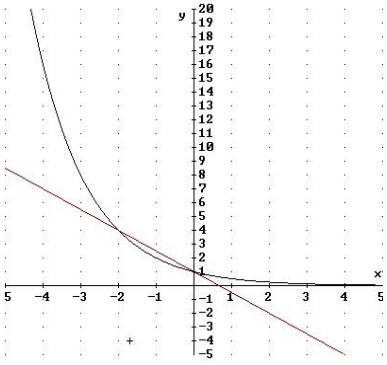
Rešitve:

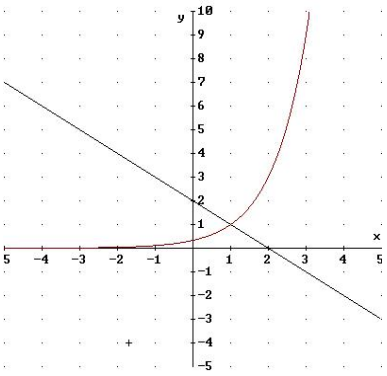


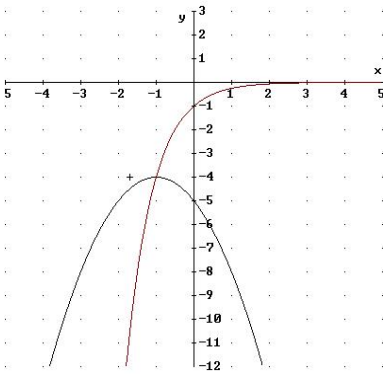








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