UČNI LIST – Eksponentna funkcija in enačba

1) Nariši grafe eksponentnih funkcij:

a) $f(x)=4^x$

b) $f(x)=\left(\frac{5}{2}\right)^x$

c) $f(x)=\left(\frac{3}{4}\right)^x$

d) $f(x)=\left(\frac{1}{3}\right)^x$

e) $f(x)=\left(\frac{9}{5}\right)^x$

f) $f(x)=\left(\frac{2}{5}\right)^x$

2) Nariši grafe eksponentnih funkcij:

a) $f(x)=3^x$

b) $f(x)=3^{-x}$

c) $f(x)=2^x$

d) $f(x)=2^{-x}$

e) $f(x)=3\cdot 2^x$

f) $f(x)=\frac{3}{5}\cdot 2^x$

3) Nariši grafe eksponentnih funkcij:

a) $f(x)=2^x+1$

b) $f(x)=3^x+\frac{1}{2}$

c) $f(x)=4^x-3$

d) $f(x)=\left(\frac{7}{2}\right)^x-\frac{5}{2}$

e) $f(x)=\left(\frac{3}{8}\right)^x+2$

f) $f(x)=\left(\frac{7}{4}\right)^x+\frac{3}{4}$

4) Nariši grafe eksponentnih funkcij:

a) $f(x)=2^{x+1}$

b) $f(x)=3^{x-2}$

c) $f(x)=4^{x-4}$

d) $f(x)=2^{x-1}$

e) $f(x)=\left(\frac{1}{2}\right)^{x+2}$

f) $f(x)=\left(\frac{3}{7}\right)^{x-3}$

5) Za dane funkcije zapiši ničlo (če obstaja), začetno vrednost in enačbo vodoravne asimptote. Nato nariši graf eksponentne funkcije:

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

b) $f(x)=3^{x+1}-2$

c) $f(x)=4^{-x+2}+1$

d) $f(x)=2^{x-4}+\frac{3}{2}$

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

f) $f(x)=\left(\frac{2}{5}\right)^{-x-1}-\frac{5}{2}$

6) Reši eksponentne enačbe:

a) $3^x=81$

b) $2^x=32$

c) $0{,}7^x=1$

d) $13^x=-169$

e) $2^{x-4}=16$

f) $5^{x+3}=625$

g) $10^{2x-3}=100000$

h) $7^{3x}=343$

7) Reši eksponentne enačbe:

a) $4^{1-5x}=64$

b) $5^{x-1}=\frac{1}{125}$

c) $16^{3x+2}=8^{x-1}$

d) $27^{2x-7}=243$

e) $7^x=\sqrt{7}$

f) $5^x=5\cdot\sqrt[5]{5}$

g) $2^x=\frac{\sqrt{2}}{2}$

h) $3^x=\sqrt{3\cdot\sqrt{3}}$

8) Reši eksponentne enačbe:

a) $\left(\frac{2}{3}\right)^x=\frac{81}{16}$

b) $4^{1-5x}=64$

c) $5^{x-1}=\frac{1}{125}$

d) $0{,}6^x=\frac{125}{27}$

e) $81\cdot 3^{5x}=\sqrt[4]{27}$

f) $4^x=16\cdot\sqrt[3]{4}$

9) Reši eksponentne enačbe:

a) $16^{2x+1}=32$

b) $100^{2-x}\cdot 10^{5x-3}=1000^{2x}$

c) $\sqrt[5]{8}=16\cdot 2^{2x}$

d) $100^{3x-2}=0{,}1^{x}\cdot\sqrt[4]{1000}$

10) Reši eksponentne enačbe:

a) $32^{x-2}\cdot 16^{2x+6}=64^{2x-1}:8^{x+3}$

b) $27^{x+2}\cdot 9^{4x-5}=81^{3x-7}:3^{5x+4}$

c) $125^{x+2}\cdot 25^{2x-5}=5^{4x+2}\cdot 625$

d) $\sqrt[4]{9^{x+2}}=0{,}\overline{037}$

11) Reši eksponentne enačbe:

a) $4^{x^2-2x-11}=256$

b) $6^{x^2-6x+5}=1$

c) $2^{x^2-3x-1}=0{,}125$

d) $125\cdot 5^{x^2-x-7}=25^{x}$

e) $81\cdot 3^{x^2-8x-21}=27$

f) $16\cdot 4^{x^2-2x-8}=64^{x}$

12) Reši eksponentne enačbe:

a) $\frac{1}{8}\cdot 2^{2x^3-1}=4\cdot 2^{2+x^3}$

b) $\left(2^{2x}\right)^{x-2}=\sqrt{8}\cdot 2^{\frac{5x+9}{2}}$

c) $1000\cdot 10^{x}=\sqrt[x]{100^2}$

d) $\dfrac{\left(4^{x}\right)^{x-1}}{\sqrt{32}}:\sqrt[4]{8}=\sqrt[4]{128}\cdot 2^{x}$

13) Reši eksponentne enačbe:

a) $5^{x+1}+5^{x+2}=6$

b) $36^{x}-4\cdot 6^{x}=12$

c) $3\cdot 5^{x-5}+2^{x-3}=5^{x-4}-2^{x-5}$

d) $3^{2x+1}-2^{3x+2}=12\cdot\left(3^{2x}-2^{3x}\right)$

14) Kje se sekata grafa funkcij $f(x)=5\cdot 2^{x}$ in $g(x)=9\cdot 2^{x-1}+8$?

15) a) Zapiši funkcijo oblike $y=a^{x+2}$, če je $f(1)=27$.

b) Izračunaj $f(-4)$.

c) Za kateri x velja $f(x)=81^{-1}$?

16) a) Zapiši funkcijo oblike $f(x)=a^{x-5}$, ki poteka skozi točko $T\left(2\,,\,\frac{1}{8}\right)$.

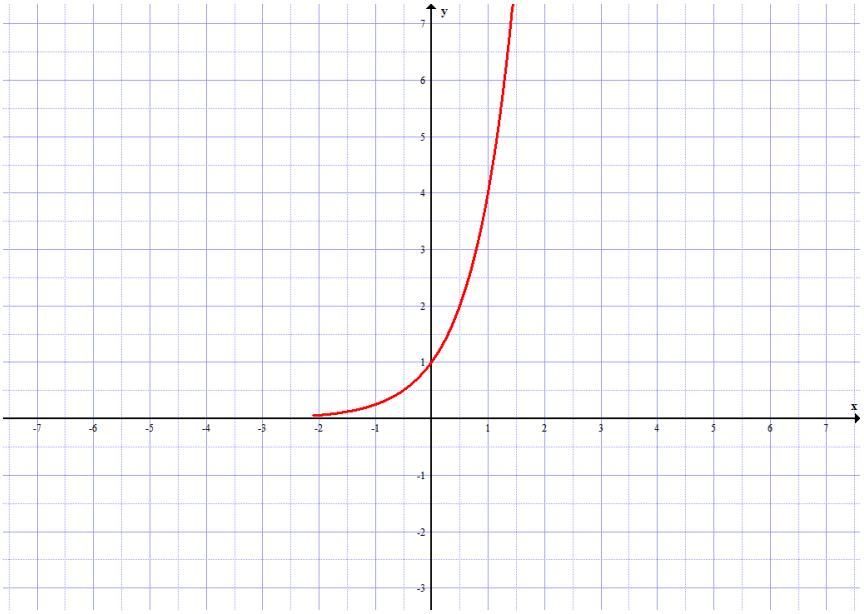
b) Izračunaj $f(4)$.

c) Za kateri x velja $f(x)=16$?

d) Izračunaj presečišče funkcije $f(x)$ in funkcije $g(x)=8^{x-1}$.

REŠITVE UČNEGA LISTA – Eksponentna funkcija in enačba

1) a)



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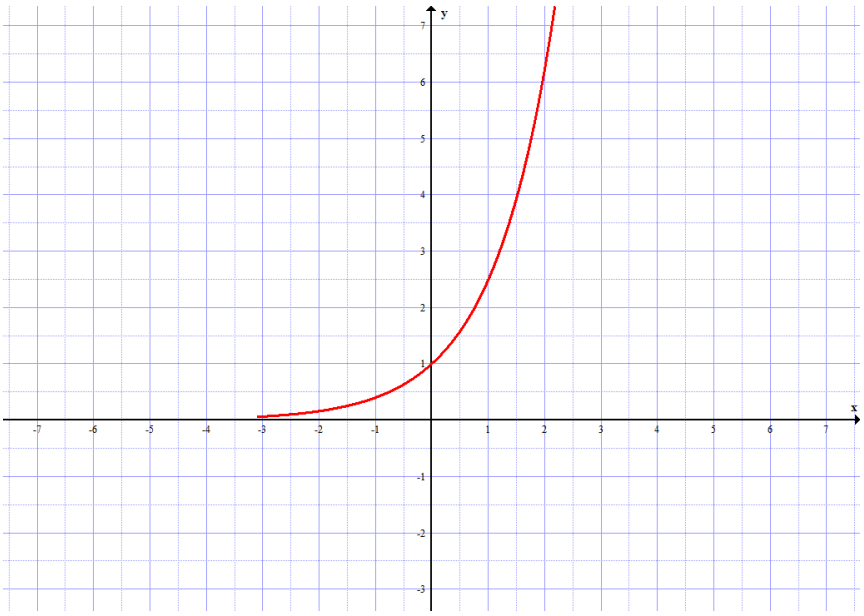

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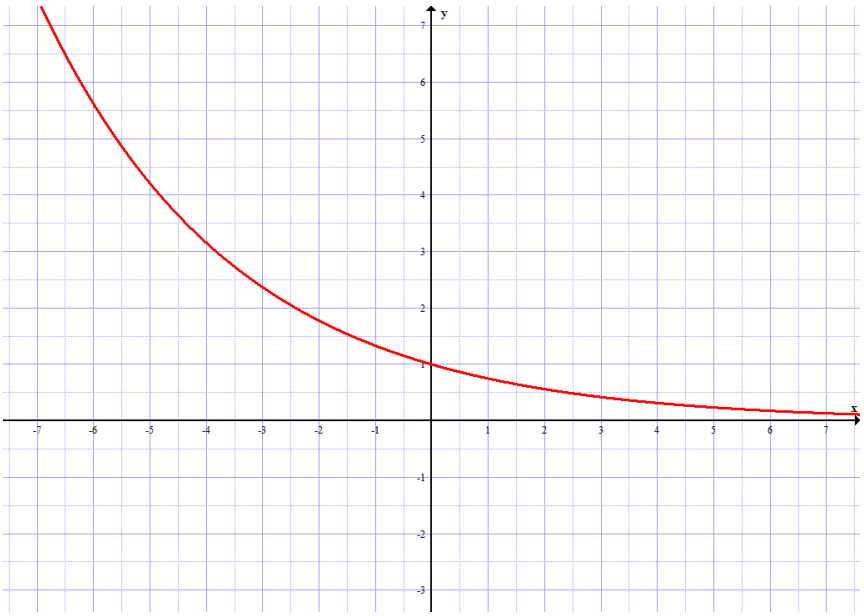

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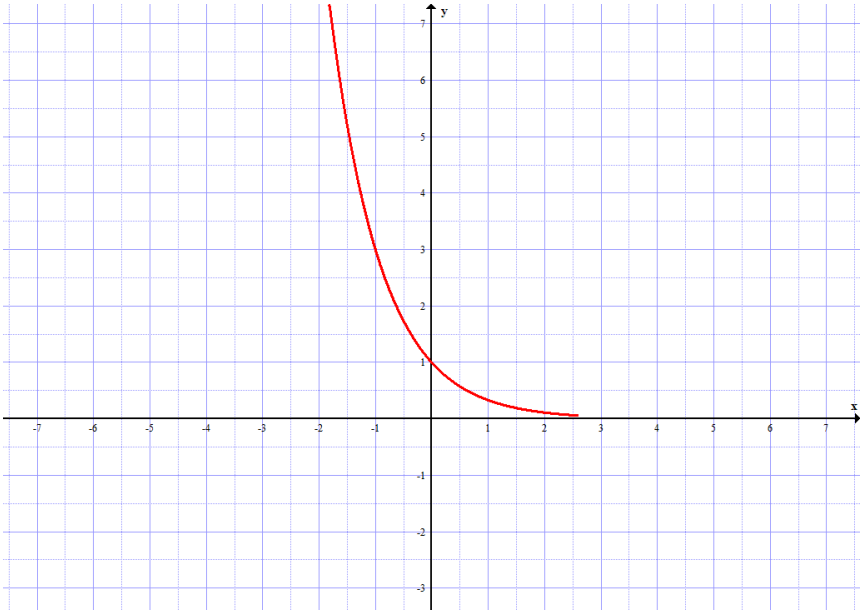
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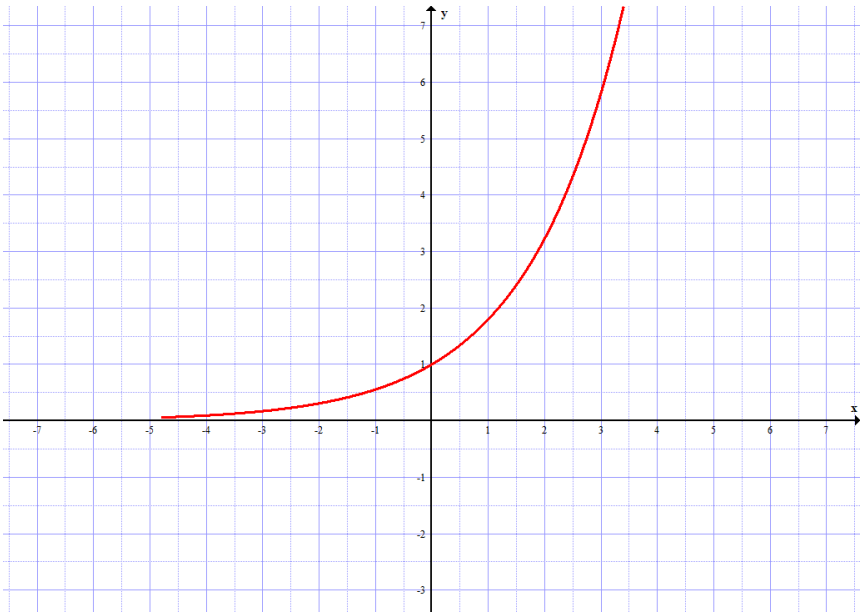
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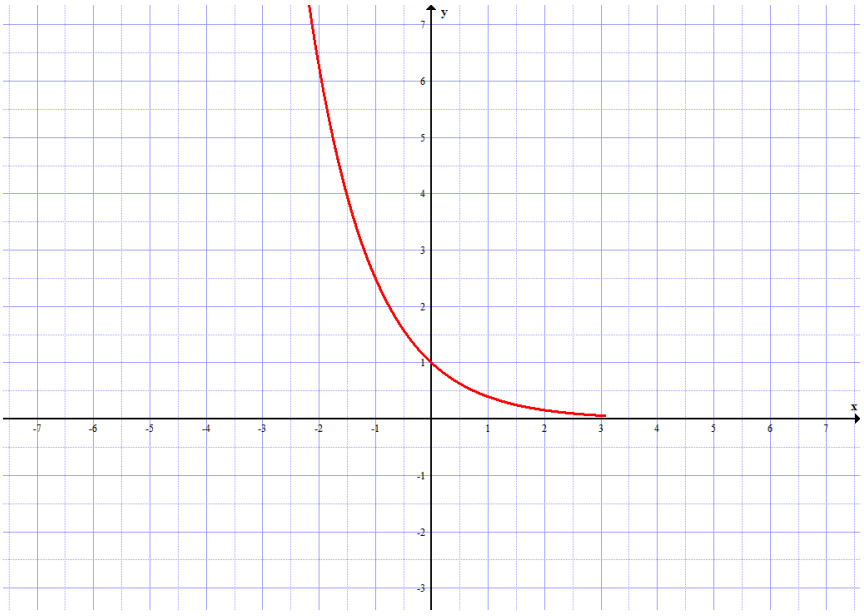
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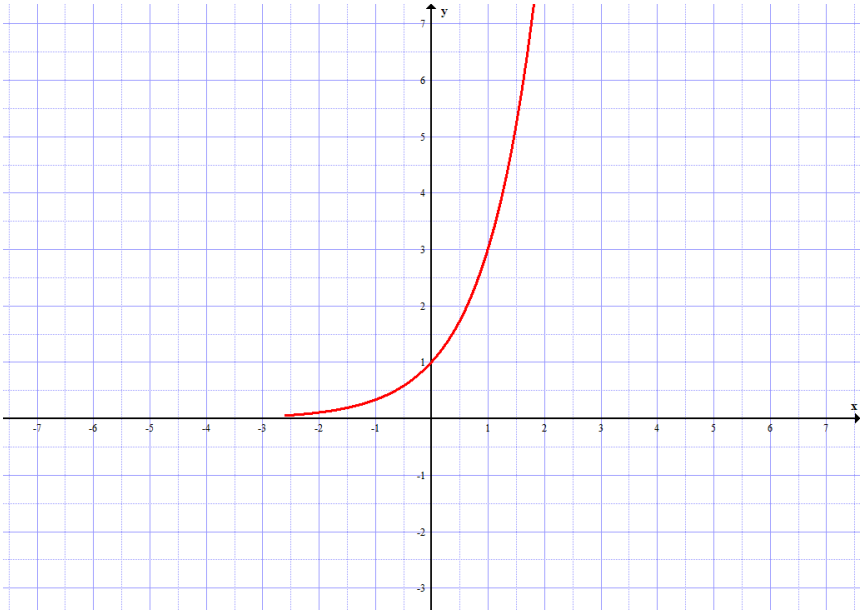
2) a)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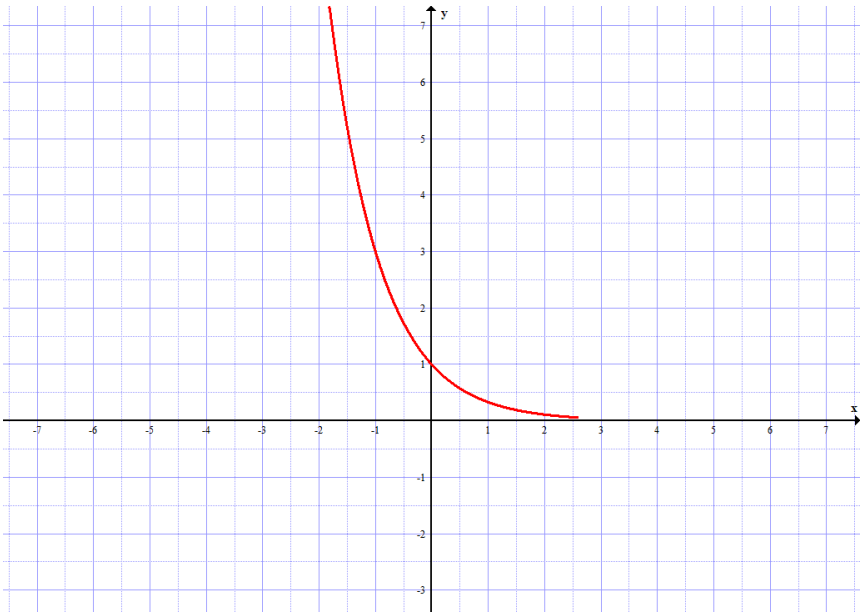
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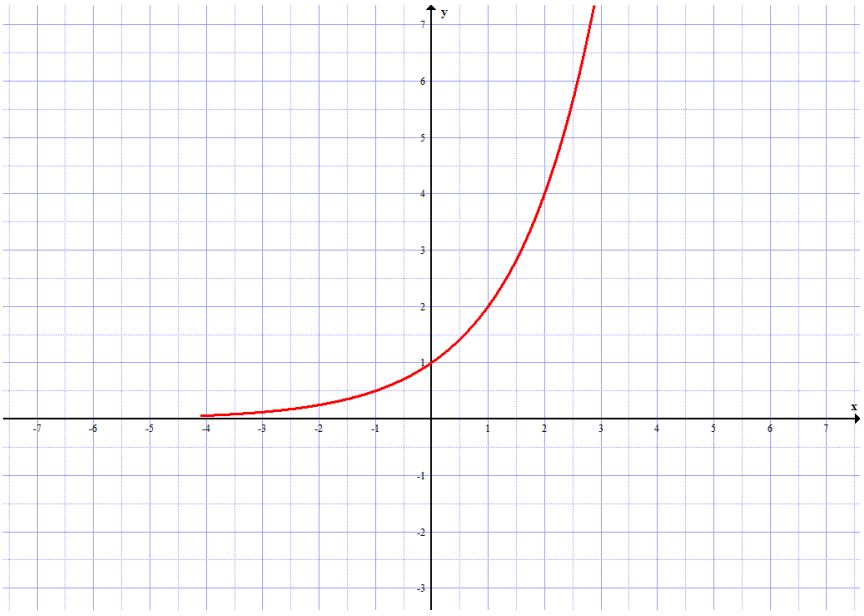
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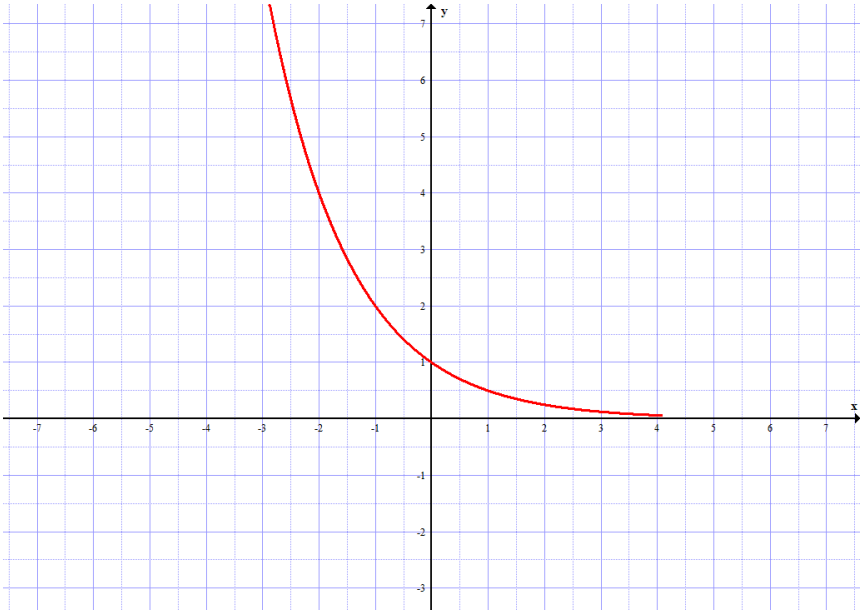
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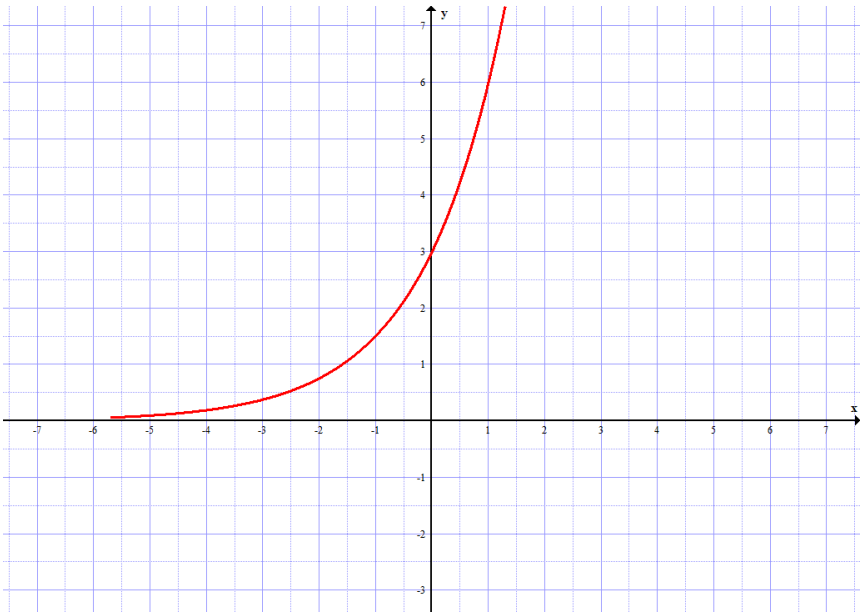
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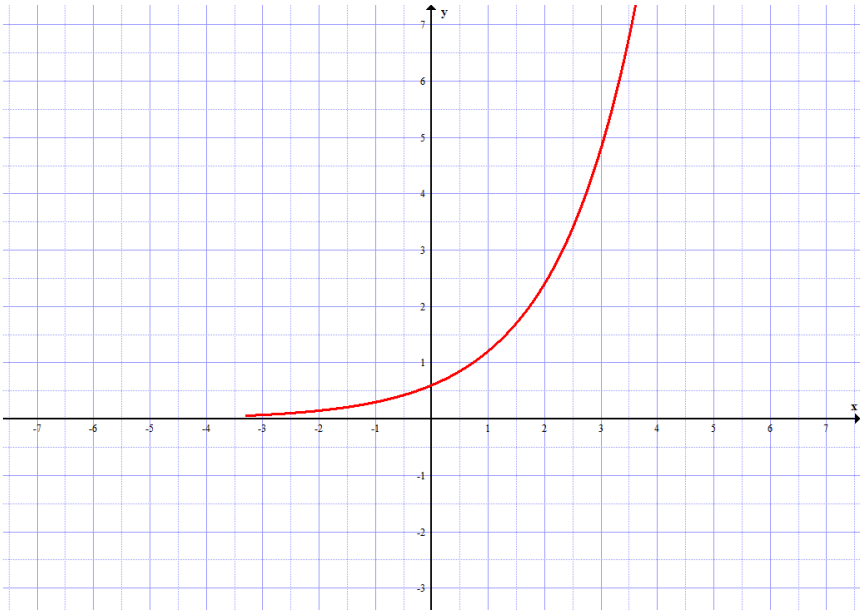
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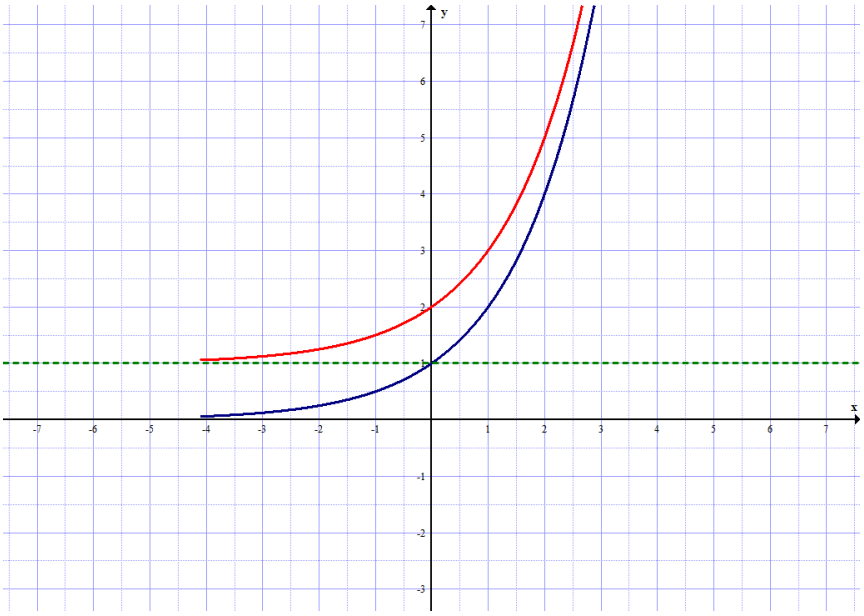
3) a)



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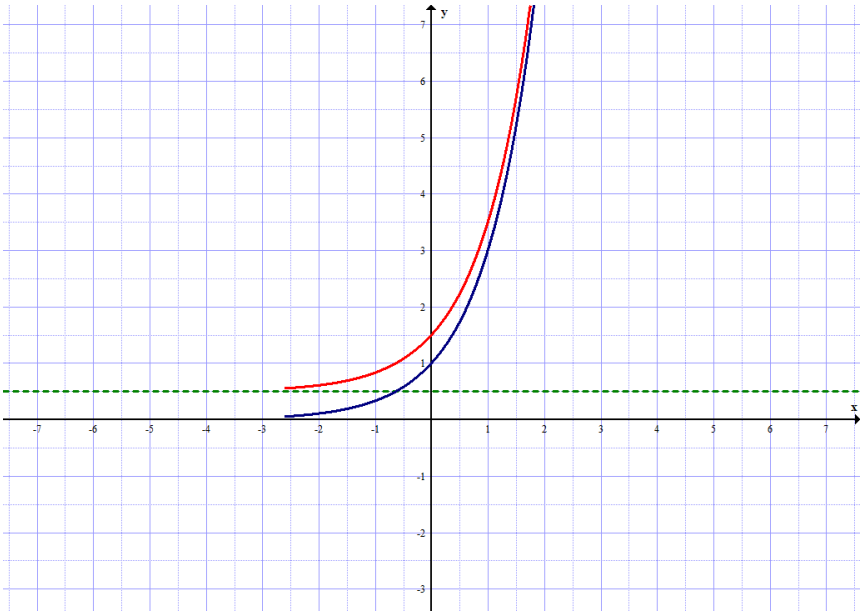

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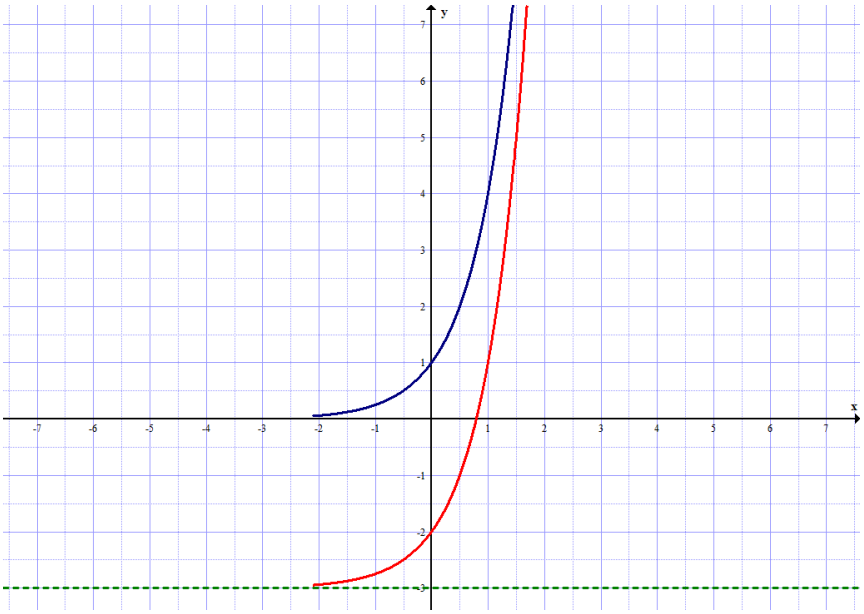

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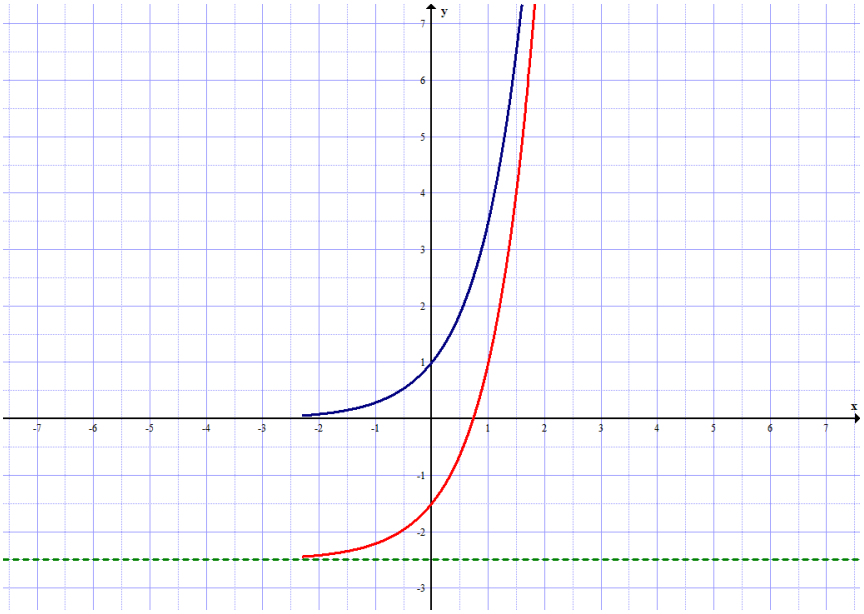

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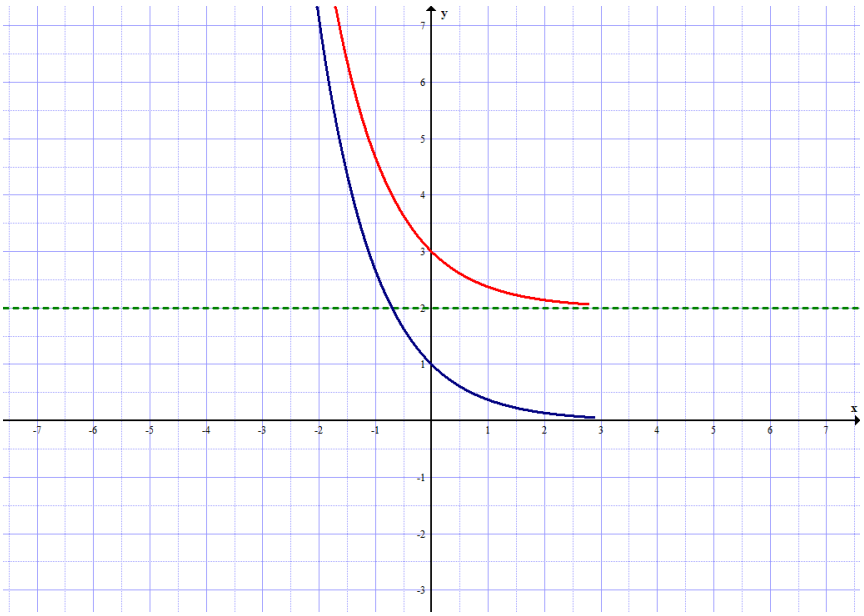

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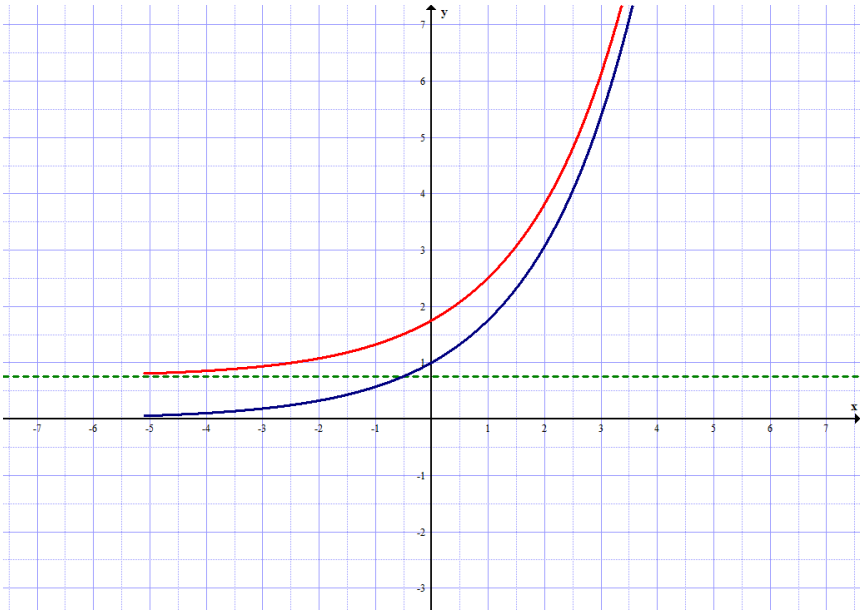

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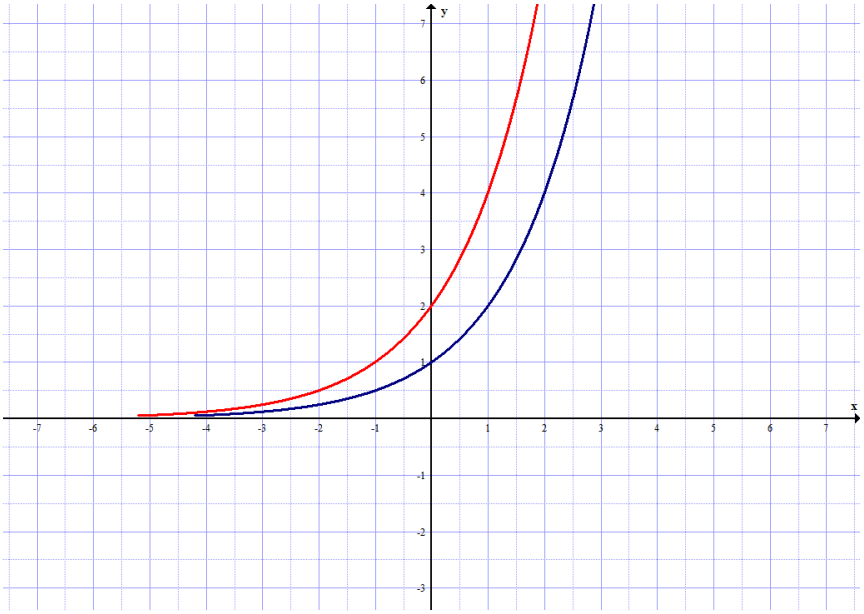
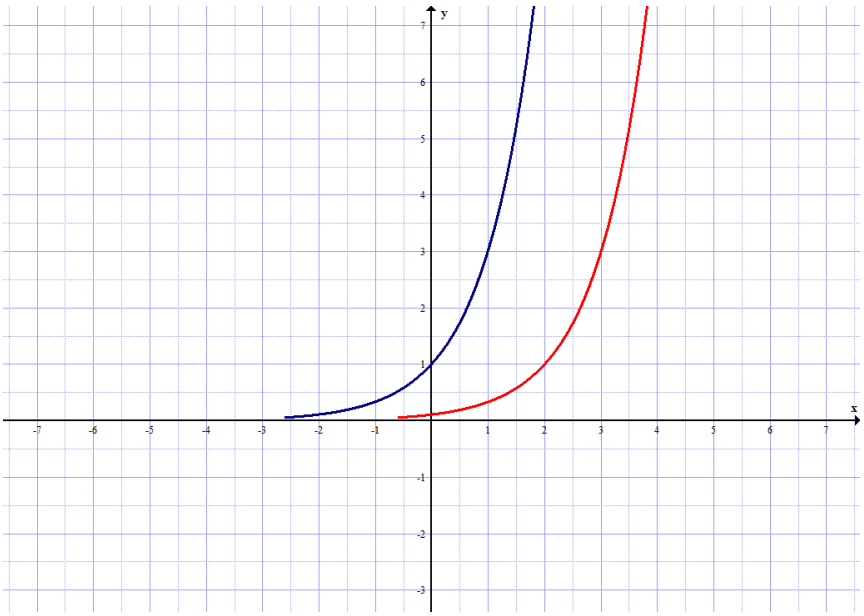


b)



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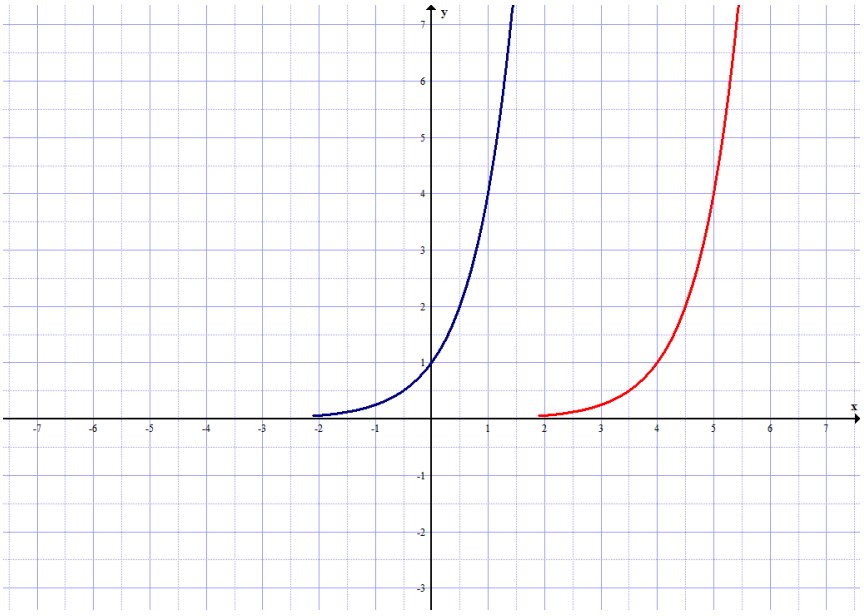

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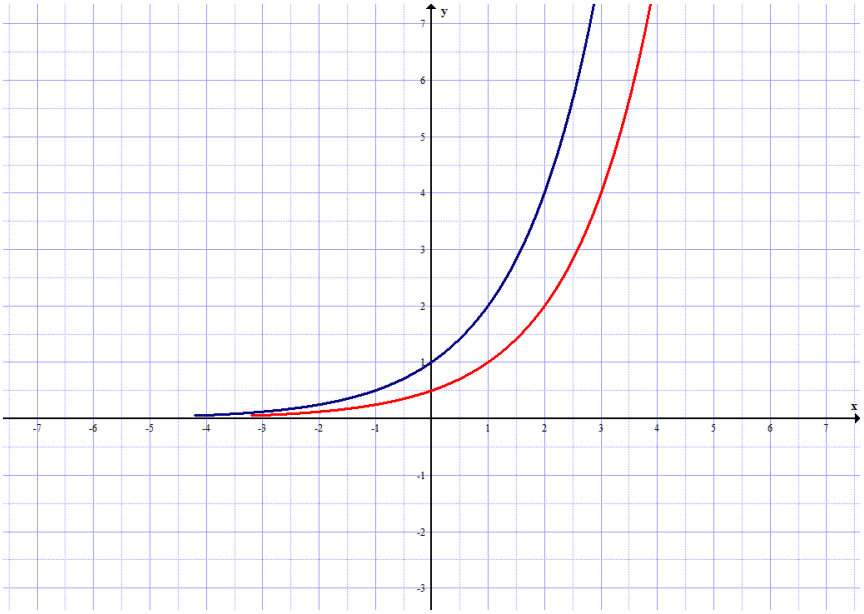

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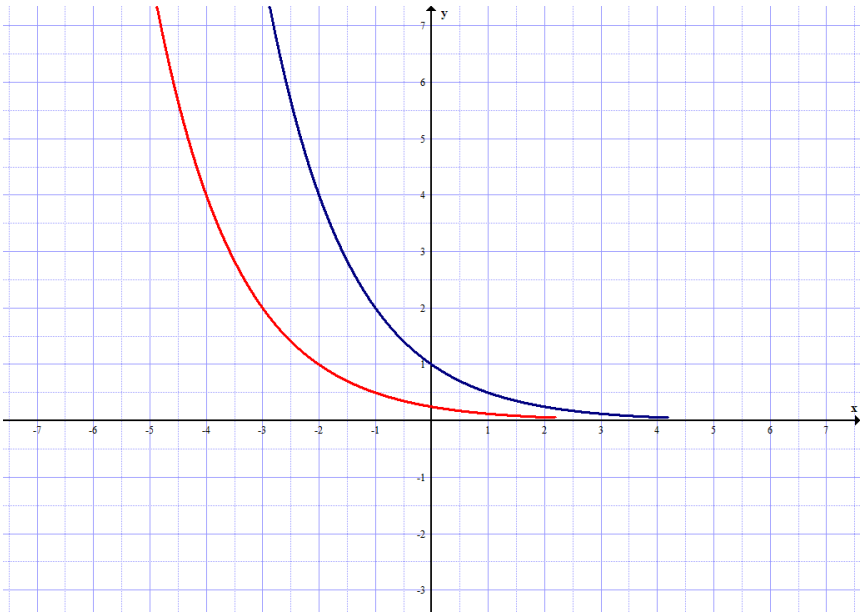

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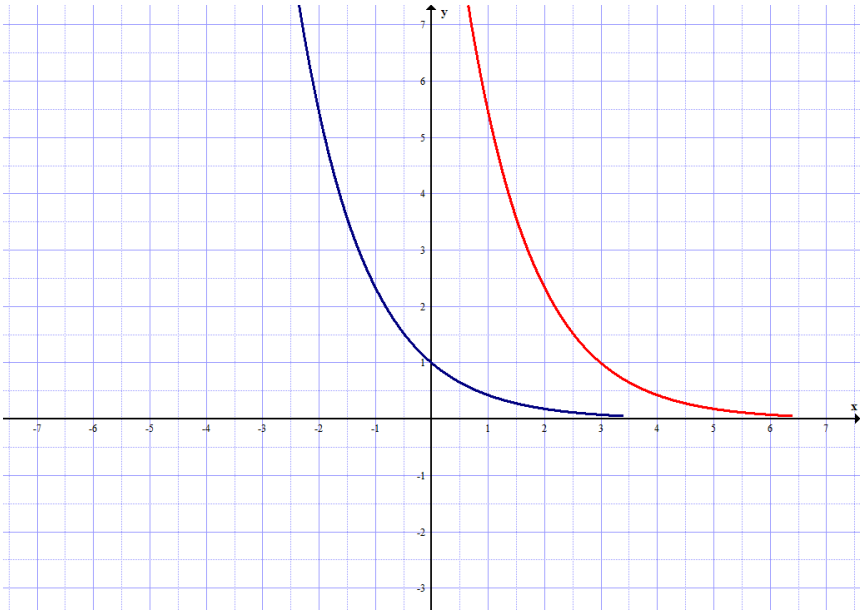
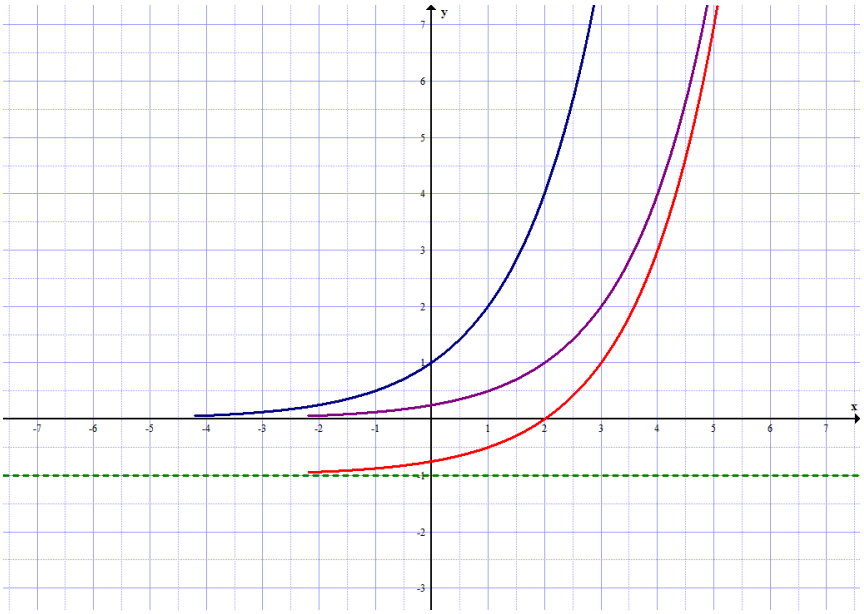
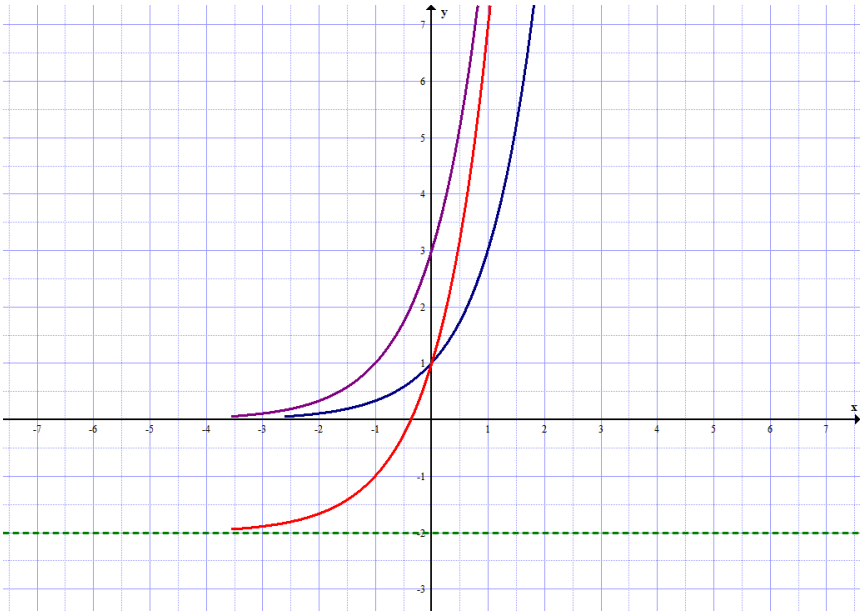


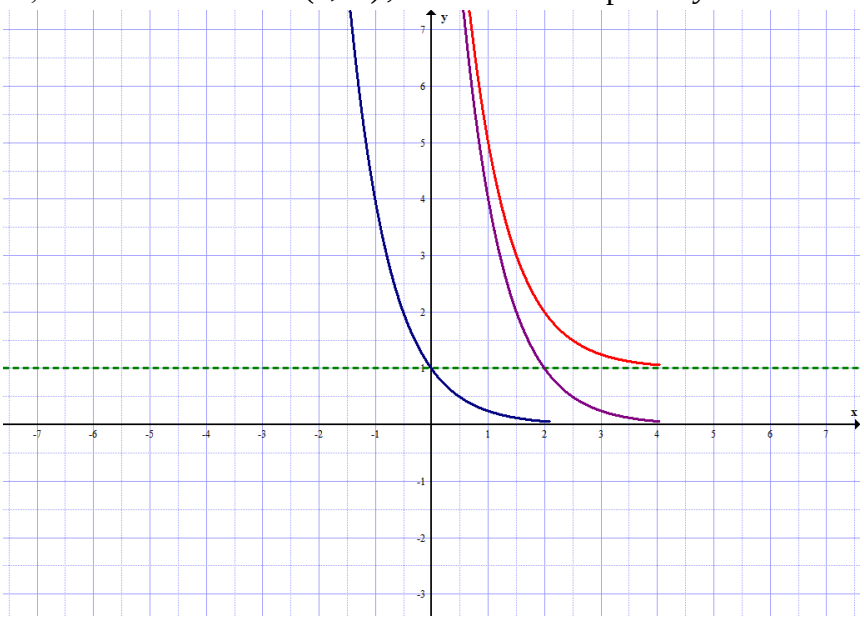
5) a) ničla: $x = 2$, začetna vrednost: $A(0, -\frac{3}{4})$, vodoravna asimptota: $y = -1$



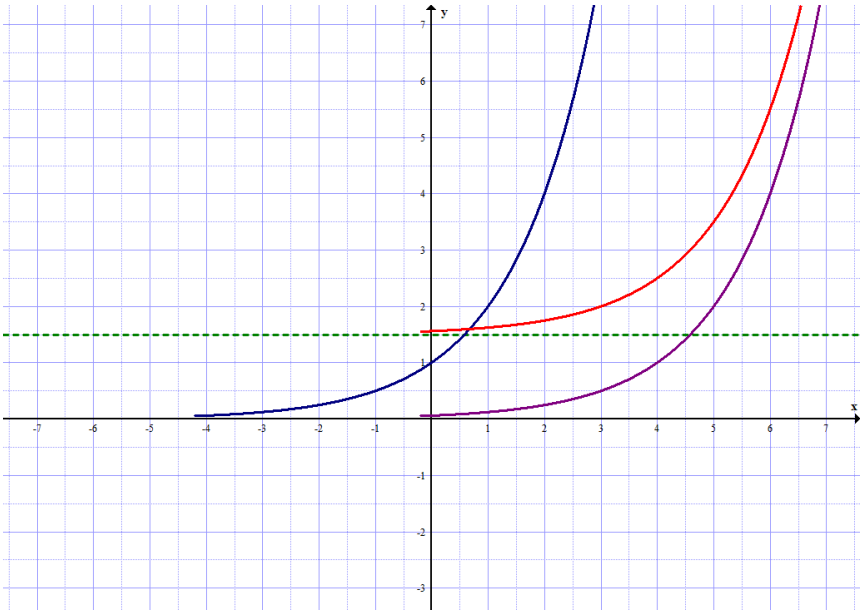
b) ničla: $x = -0^{\cdot}3691$, začetna vrednost: $A(0,1)$, vodoravna asimptota: $y = -2$



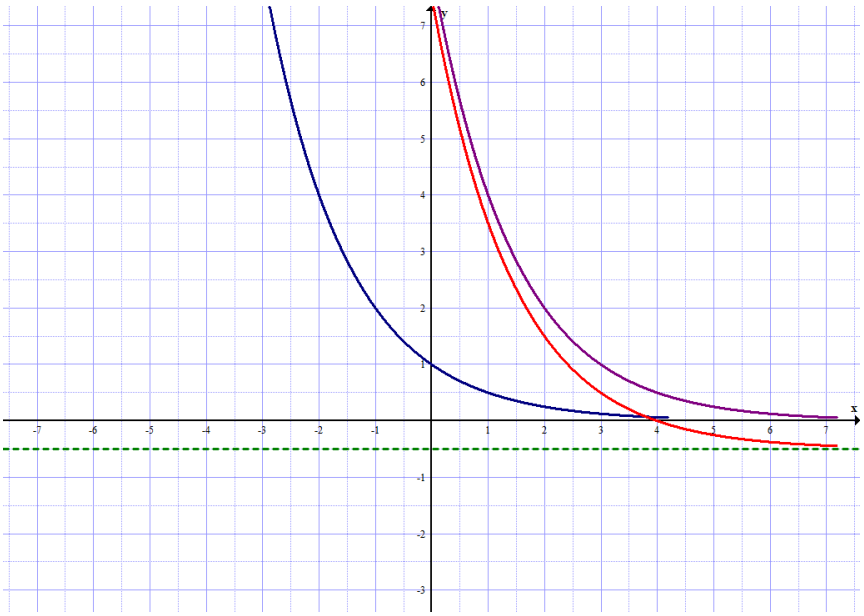
c) ničla: je ni, začetna vrednost: $A(0,17)$, vodoravna asimptota: $y = 1$



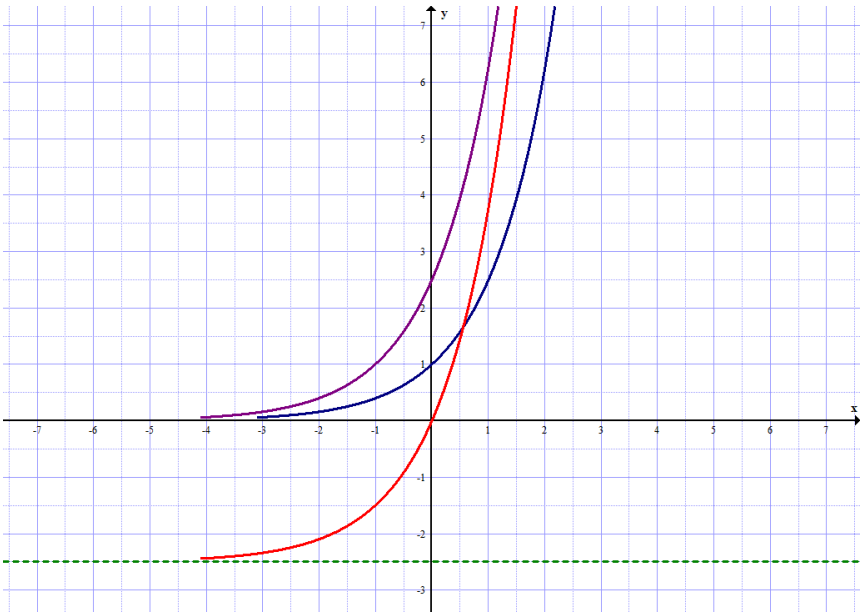
d) ničla: je ni, začetna vrednost: $A(0,1\frac{9}{16})$, vodoravna asimptota: $y=\frac{3}{2}$



e) ničla: $x=4$, začetna vrednost: $A(0,7\frac{1}{2})$, vodoravna asimptota: $y=-\frac{1}{2}$



f) ničla: $x=0$, začetna vrednost: $A(0,0)$, vodoravna asimptota: $y=-\frac{5}{2}$



6) a) $x = 4$
b) $x = 5$
c) $x = 0$
d) ni rešitve
e) $x = 8$
f) $x = 1$
g) $x = 4$
h) $x = 1$

7) a) $x = -\frac{2}{5}$
b) $x = -2$
c) $x = -\frac{11}{9}$
d) $x = \frac{13}{3}$
e) $x = \frac{1}{2}$
f) $x = \frac{6}{5}$
g) $x = -\frac{1}{2}$
h) $x = \frac{3}{4}$

8) a) $x = -4$
b) $x = \frac{1}{8}$
c) $x = \frac{1}{3}$
d) $x = -3$
e) $x = -\frac{13}{20}$
f) $x = \frac{7}{3}$

9) a) $x = \frac{1}{8}$
b) $x = \frac{1}{3}$
c) $x = -\frac{17}{10}$
d) $x = \frac{19}{28}$

10) a) $x = -7\frac{1}{4}$
b) $x = -7$
c) $x = \frac{10}{3}$
d) $x = -8$

11) a) $x_1 = -3,\ x_2 = 5$
b) $x_1 = 1,\ x_2 = 5$
c) $x_1 = 1,\ x_2 = 2$
d) $x_1 = -1,\ x_2 = 4$
e) $x_1 = -2,\ x_2 = 10$
f) $x_1 = -1,\ x_2 = 6$

12) a) $x = 2$
b) $x_1 = -\frac{3}{4},\ x_2 = 4$
c) $x_1 = -4,\ x_2 = 1$
d) $x_1 = -1,\ x_2 = \frac{5}{2}$

13) a) $x=-1$
b) $x=1$
c) $x=6$
d) $x=-1$

14) V točki $T(4,80)$

15) a) $a=3$, funkcija ima obliko $f(x)=3^{x+2}$
b) $f(-4)=\frac{1}{9}$
c) $x=-6$

16) a) $a=2$, funkcija ima obliko $f(x)=2^{x-5}$
b) $f(4)=\frac{1}{2}$
c) $x=9$
d) $P(-1,\frac{1}{64})$