

UČNI LIST – Eksponentna funkcija in enačba

1) Nariši grafe eksponentnih funkcij:

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

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

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

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

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

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

2) Nariši grafe eksponentnih funkcij:

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

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

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

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

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

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

3) Nariši grafe eksponentnih funkcij:

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

d) $f(x) = \left(\frac{7}{2}\right)^x - 3$

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

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

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

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

4) Nariši grafe eksponentnih funkcij:

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

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

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

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

c) $f(x) = 4^{x-5}$

f) $f(x) = \left(\frac{3}{4}\right)^{x-2}$

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

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

d) $f(x) = 2^{x-4} + \frac{5}{2}$

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

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

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

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

6) Reši eksponentne enačbe:

a) $3^x = 81$

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

b) $2^x = 32$

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

c) $0,7^x = 1$

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

d) $13^x = -169$

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

7) Reši eksponentne enačbe:

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

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

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

f) $5^x = 5\sqrt{5}$

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

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

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

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

8) Reši eksponentne enačbe:

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

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

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

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

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

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

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

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) $1000 \cdot 10^x = \sqrt[3]{100^2}$
- d) $\frac{(4^x)^{x-1}}{\sqrt{32}} : \sqrt[4]{8} = \sqrt[4]{128} \cdot 2^x$

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) $3^{2x+1} - 2^{3x+2} = 12(3^{2x} - 2^{3x})$

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 $T\left(2, \frac{1}{8}\right)$.

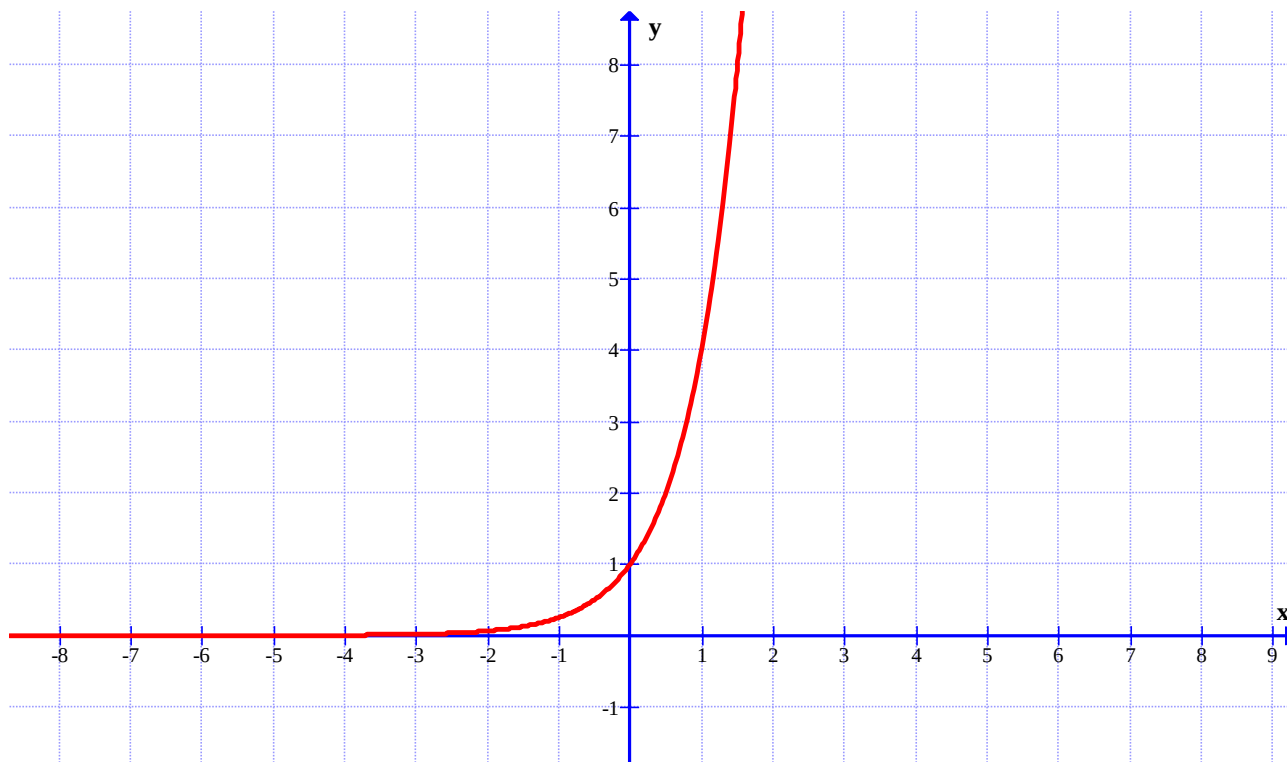
b) Izračunaj $f(4)$.

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

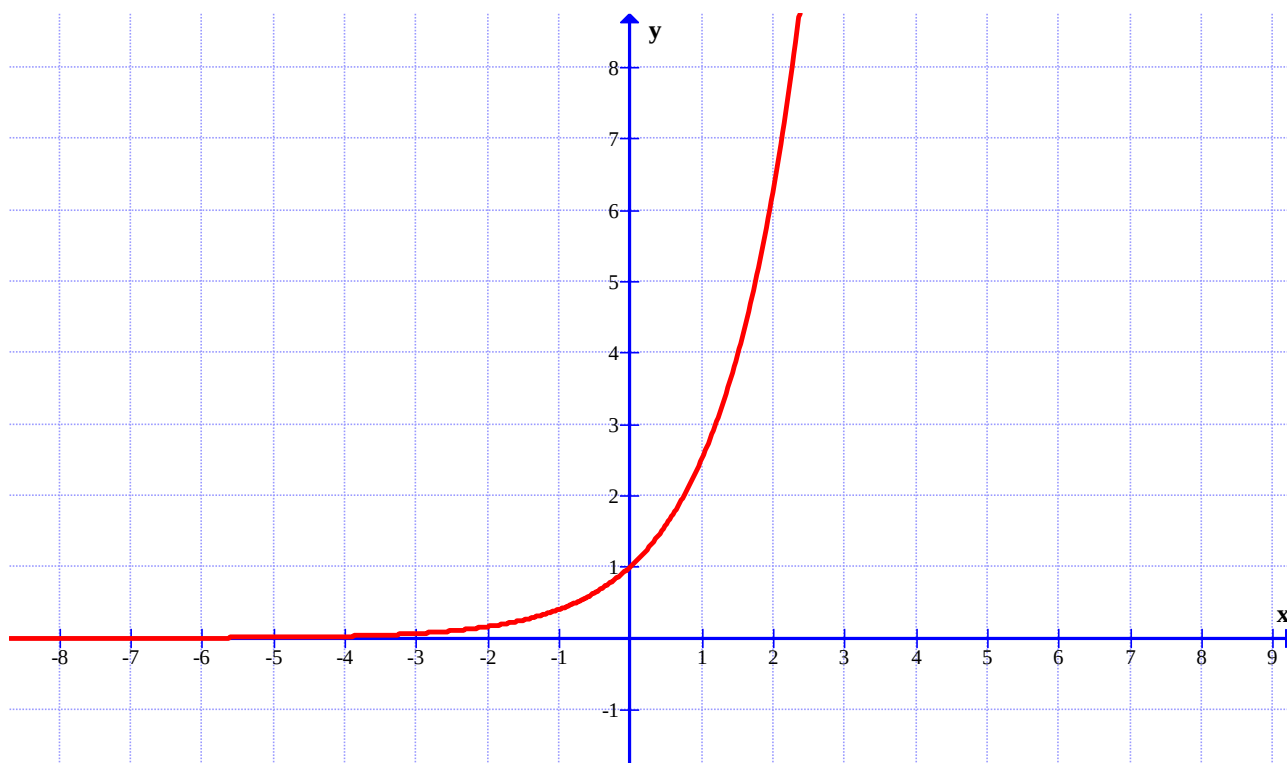
d) Izračunaj presečišče funkcije $f(x)$ in funkcije $g(x) = 8^{x-1}$.

REŠITVE UČNEGA LISTA – Eksponentna funkcija in enačba

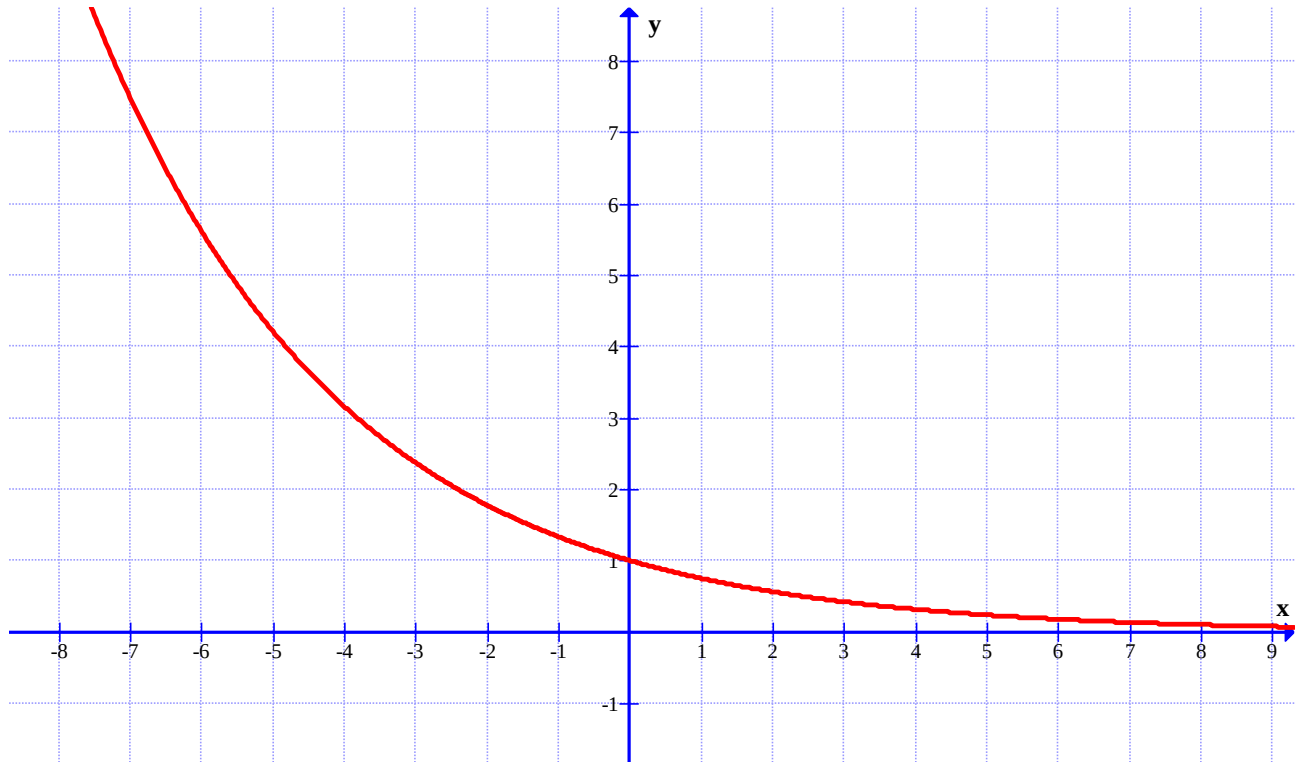
1) a)



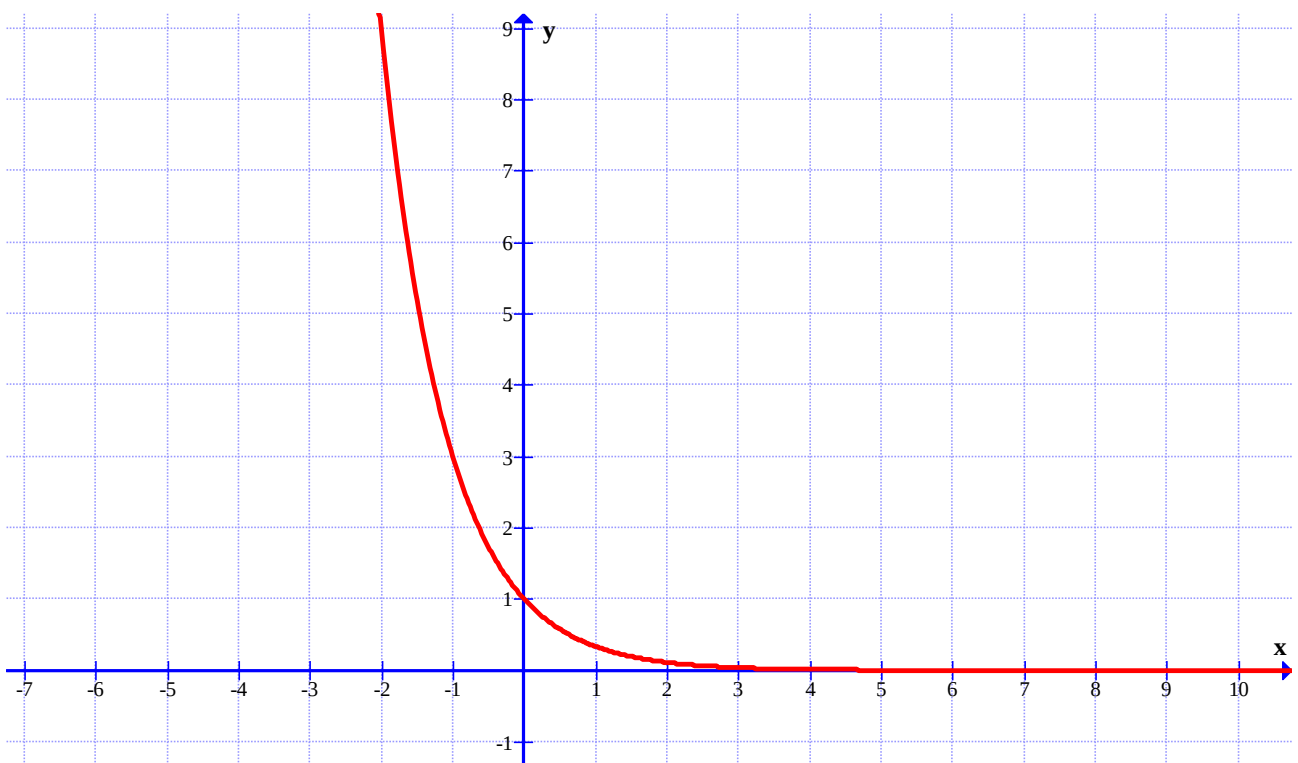
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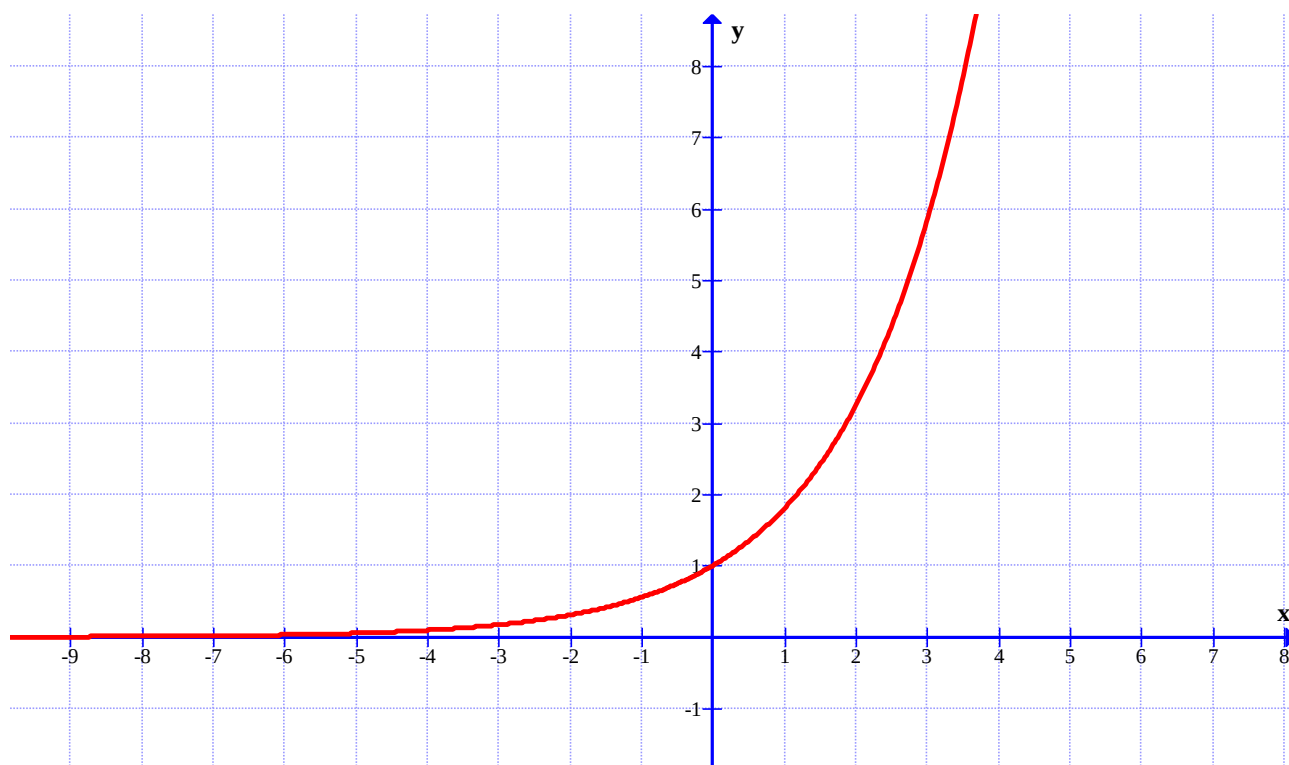
c)



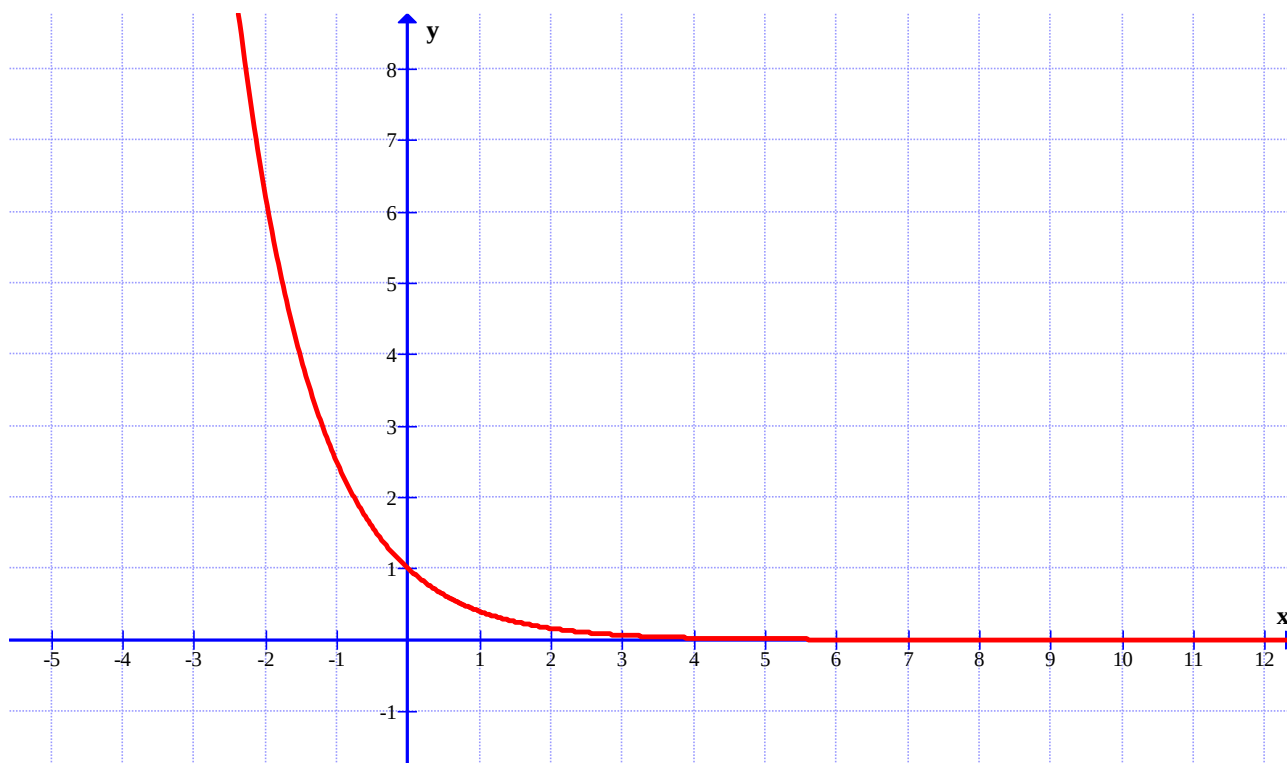
d)



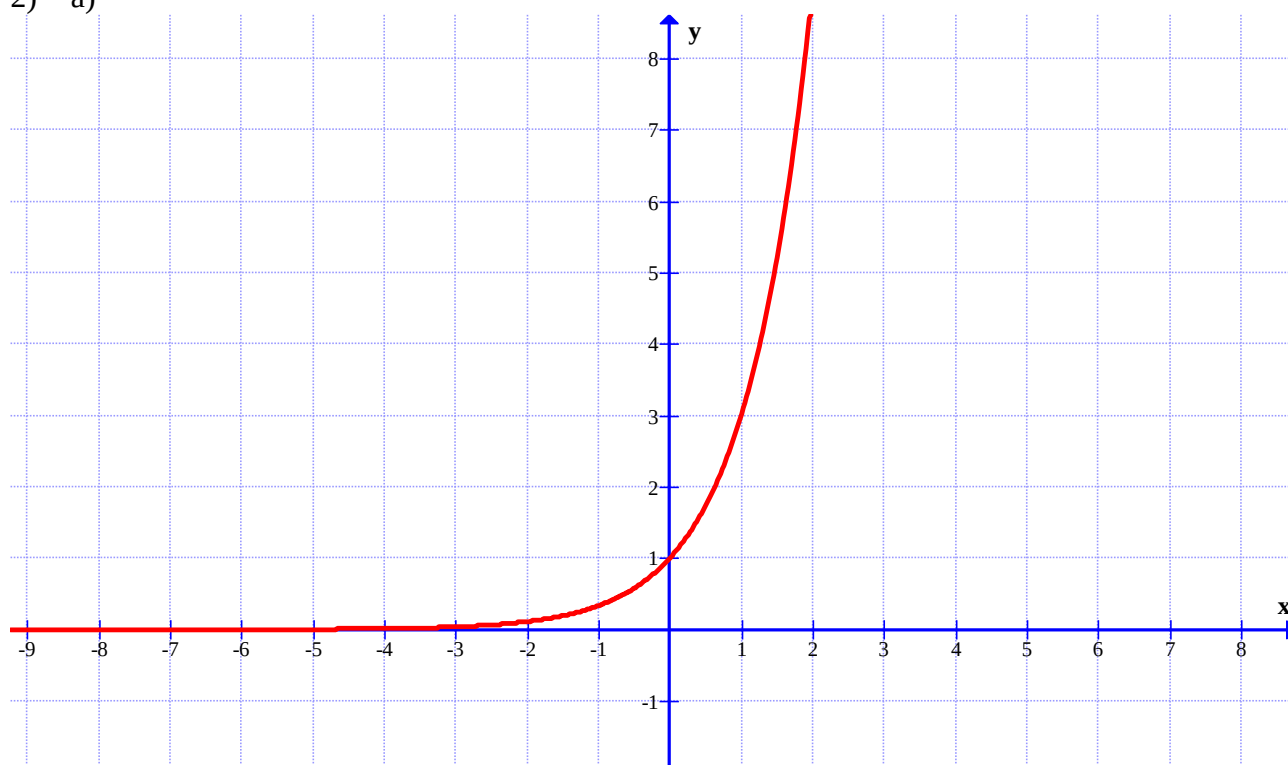
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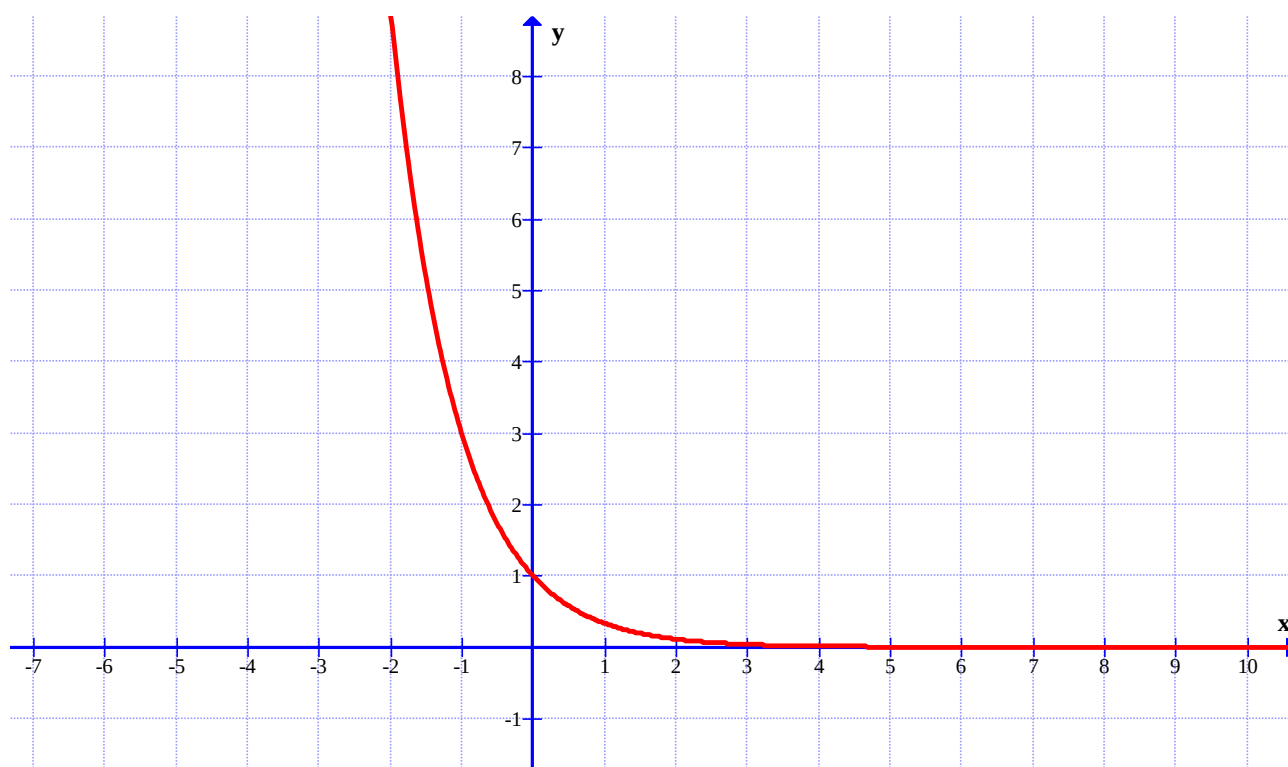
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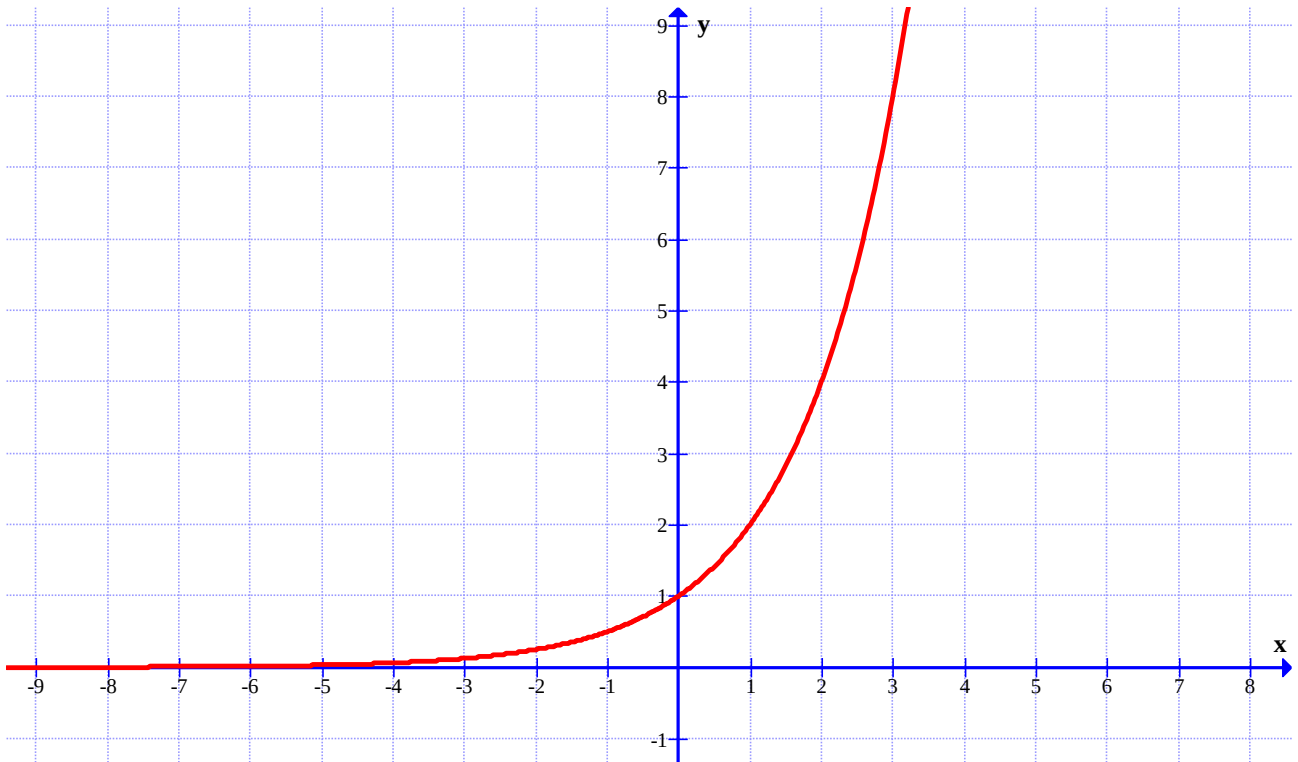
2) a)



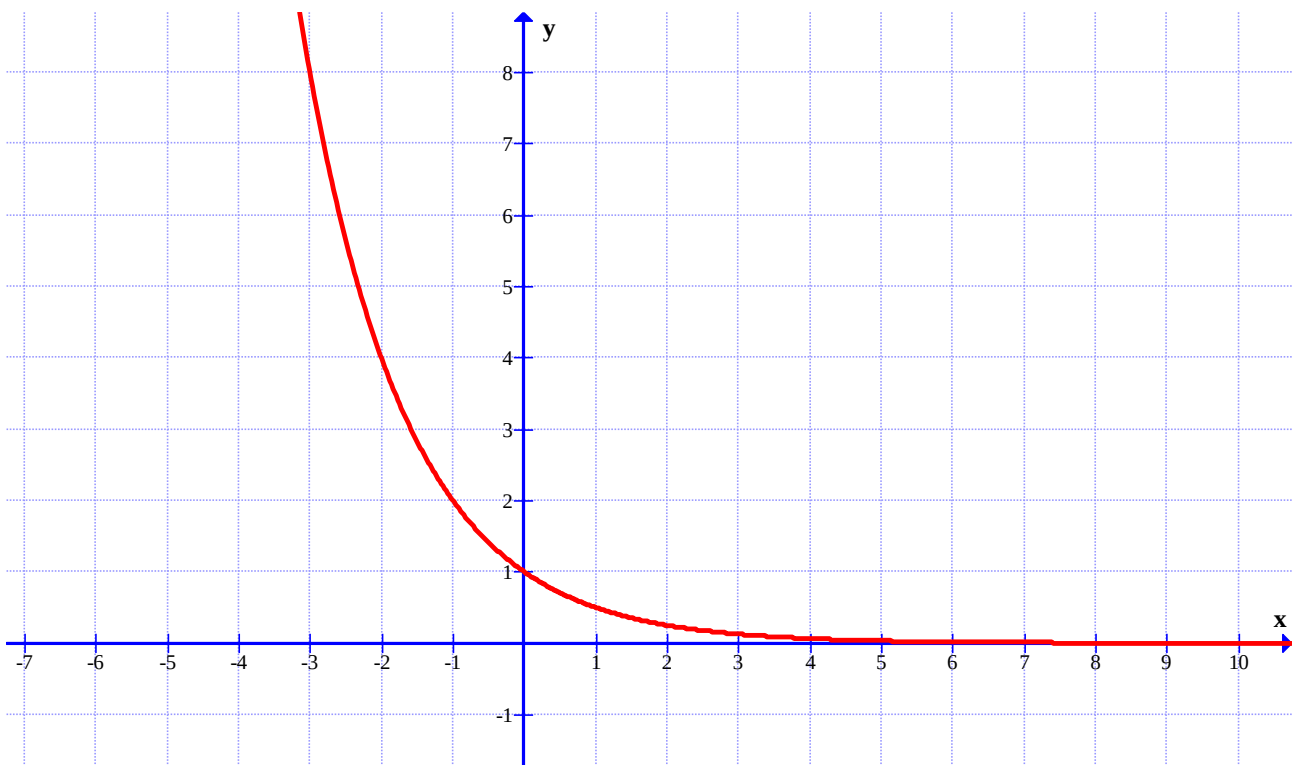
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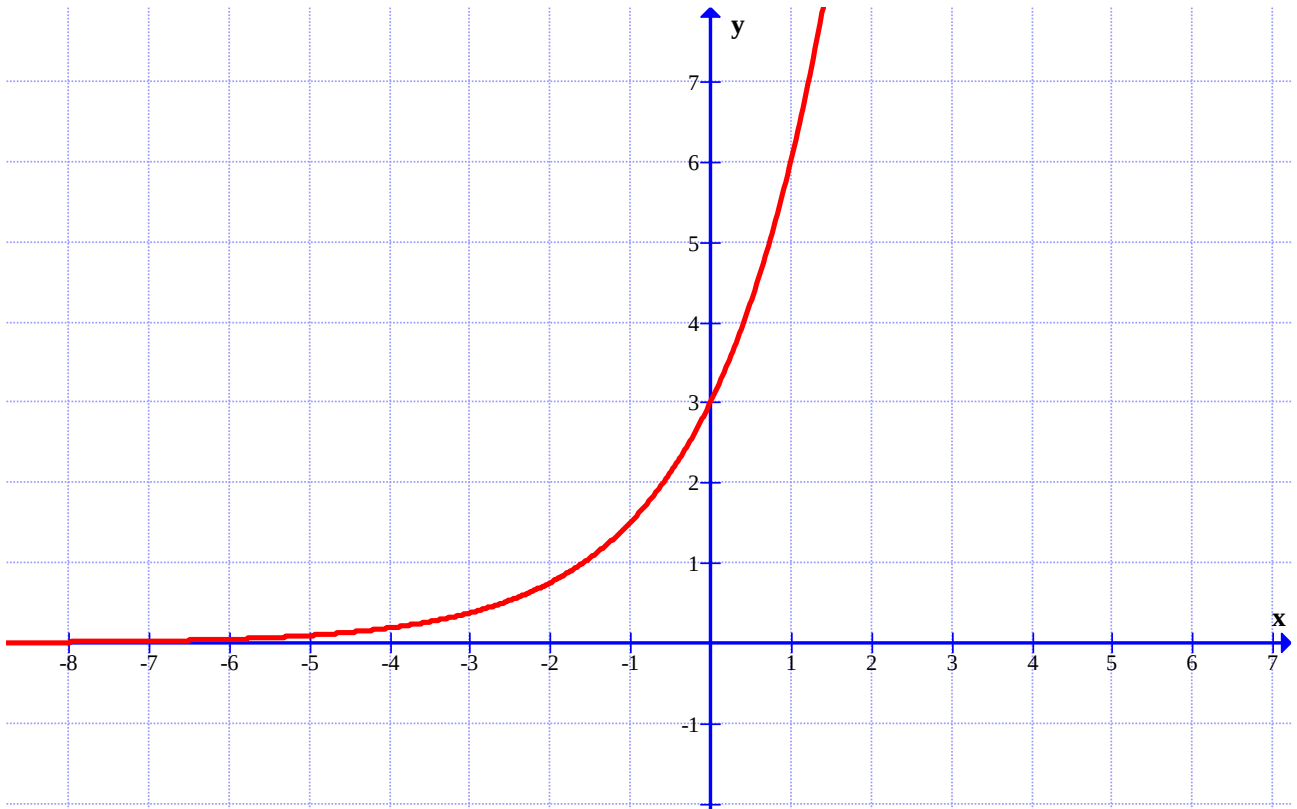
c)



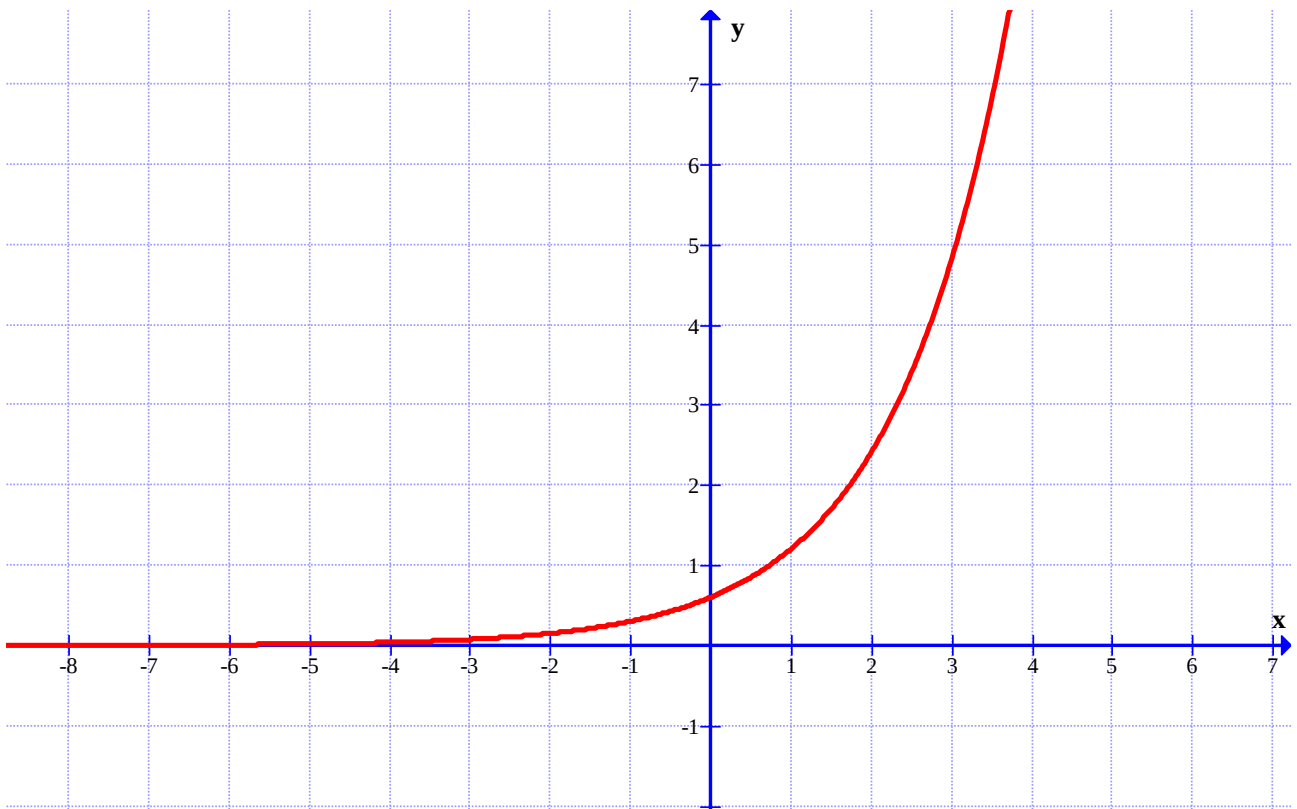
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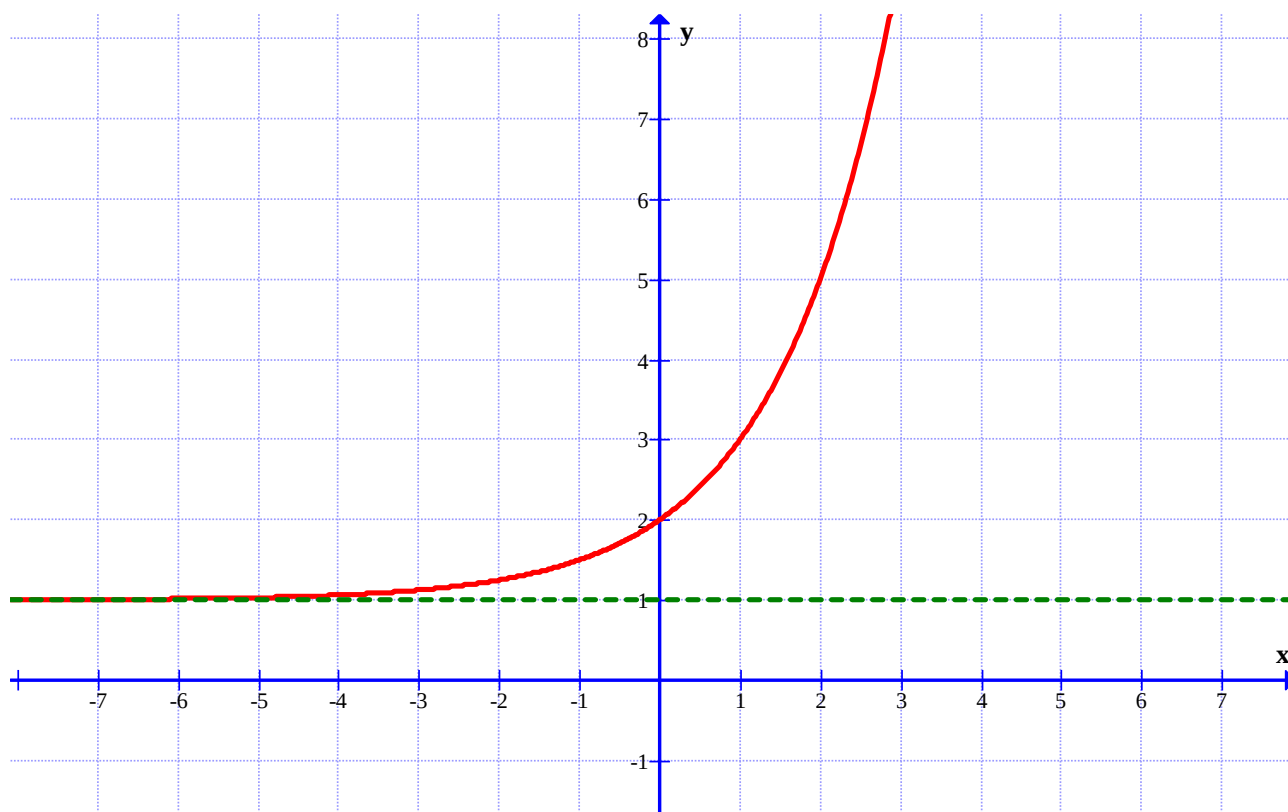
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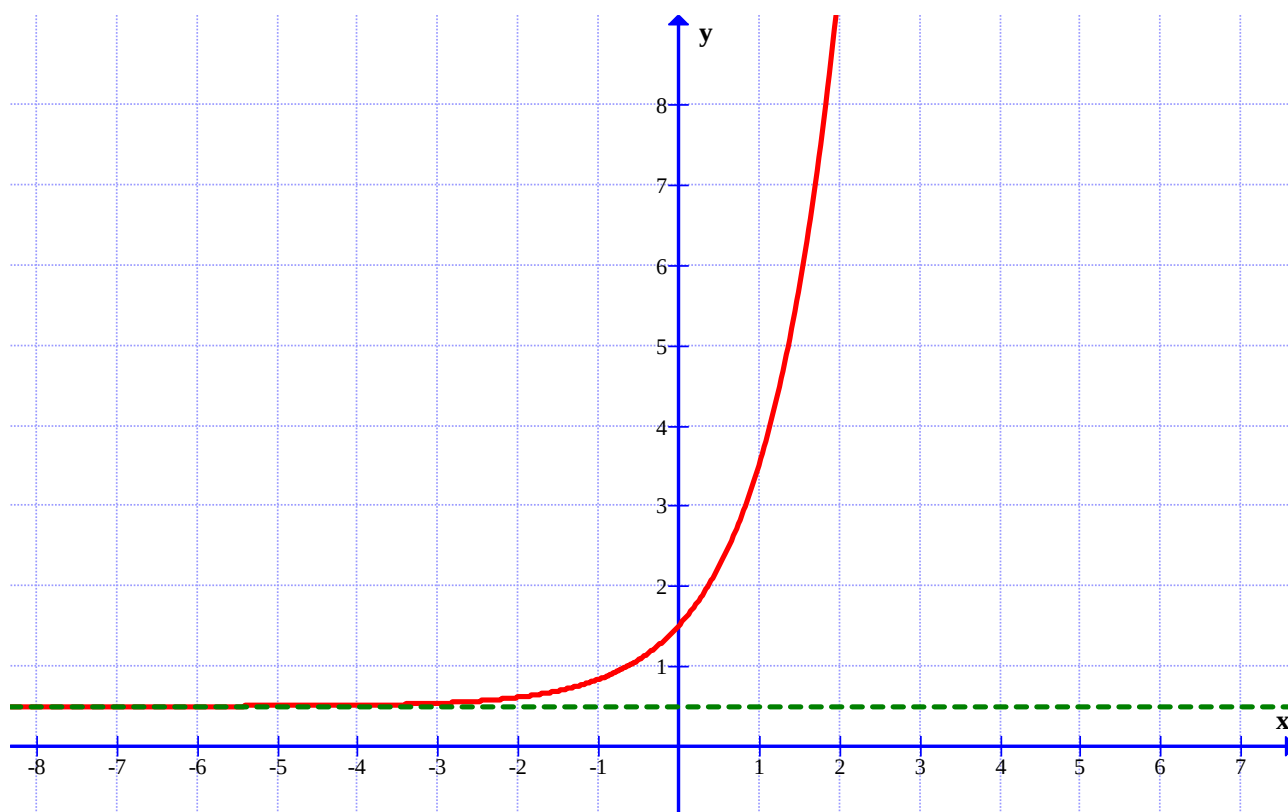
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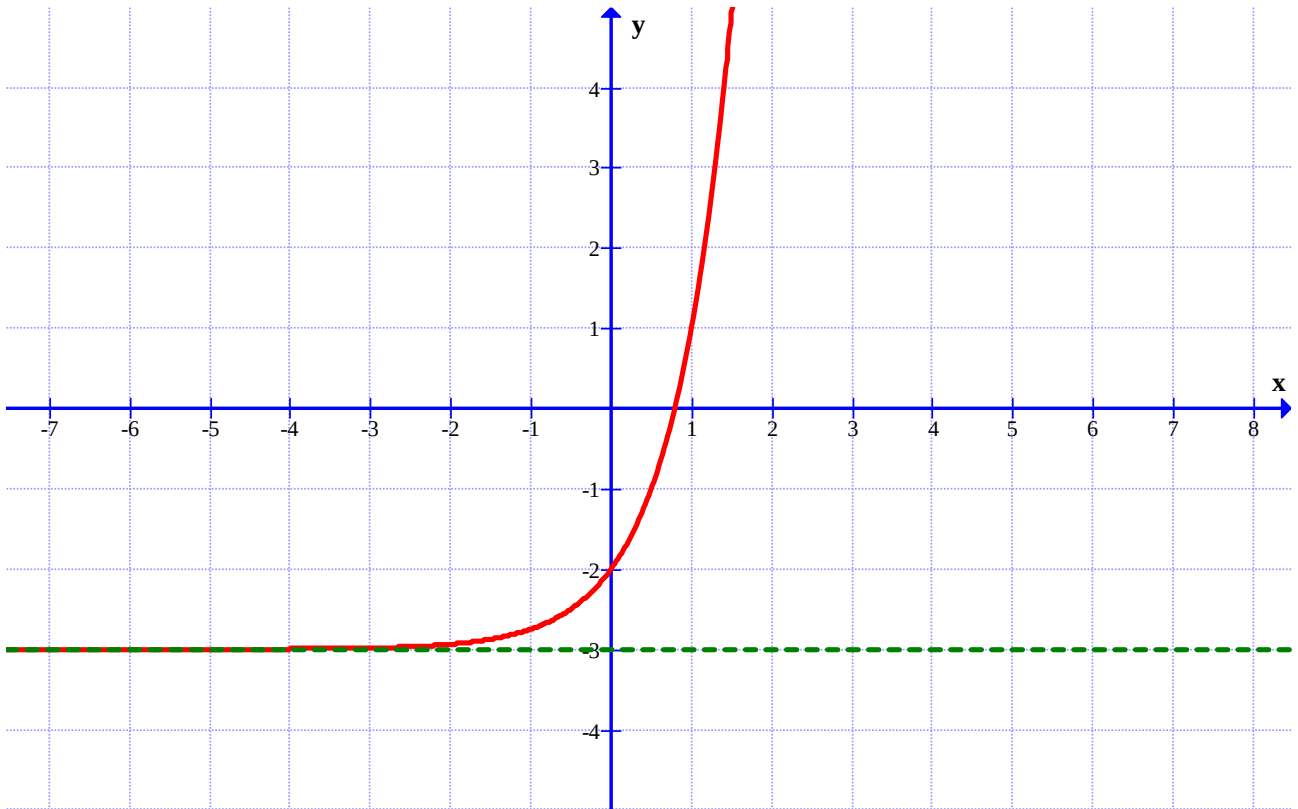
3) a)



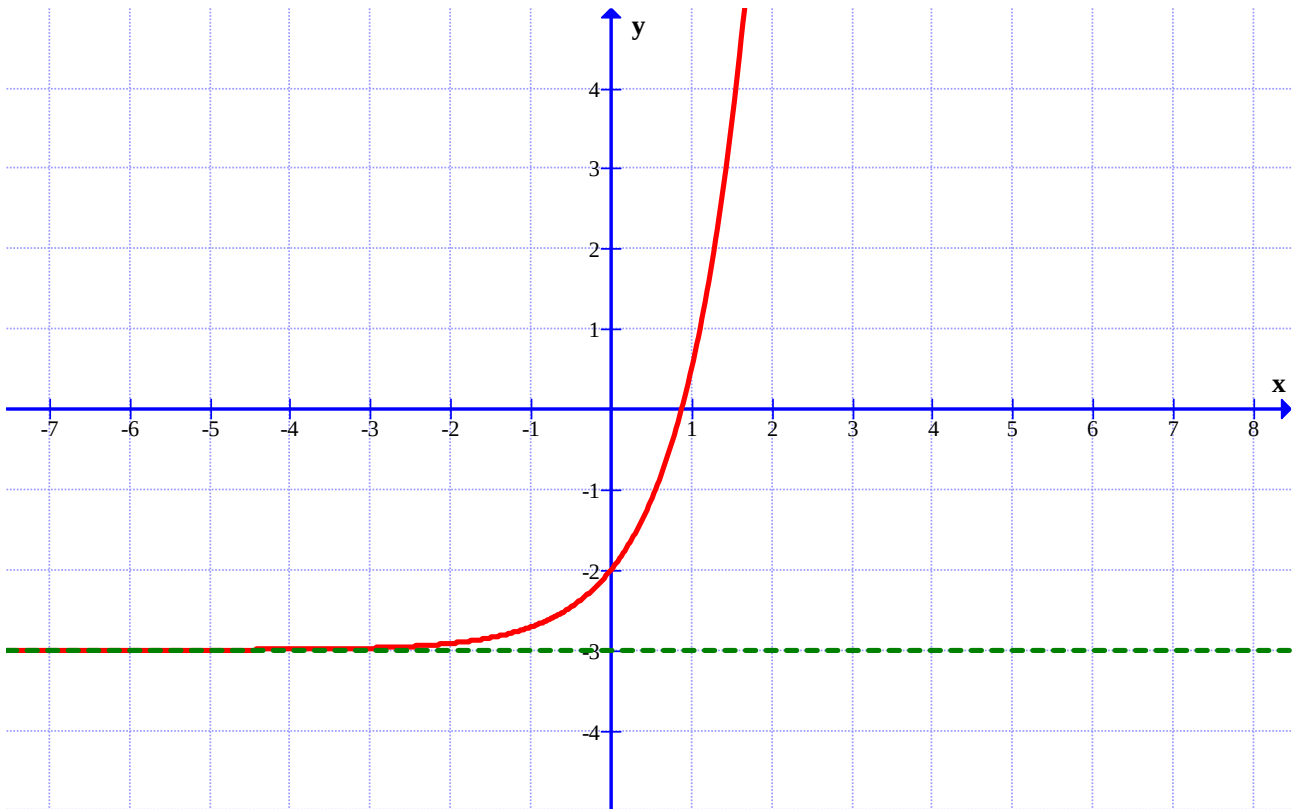
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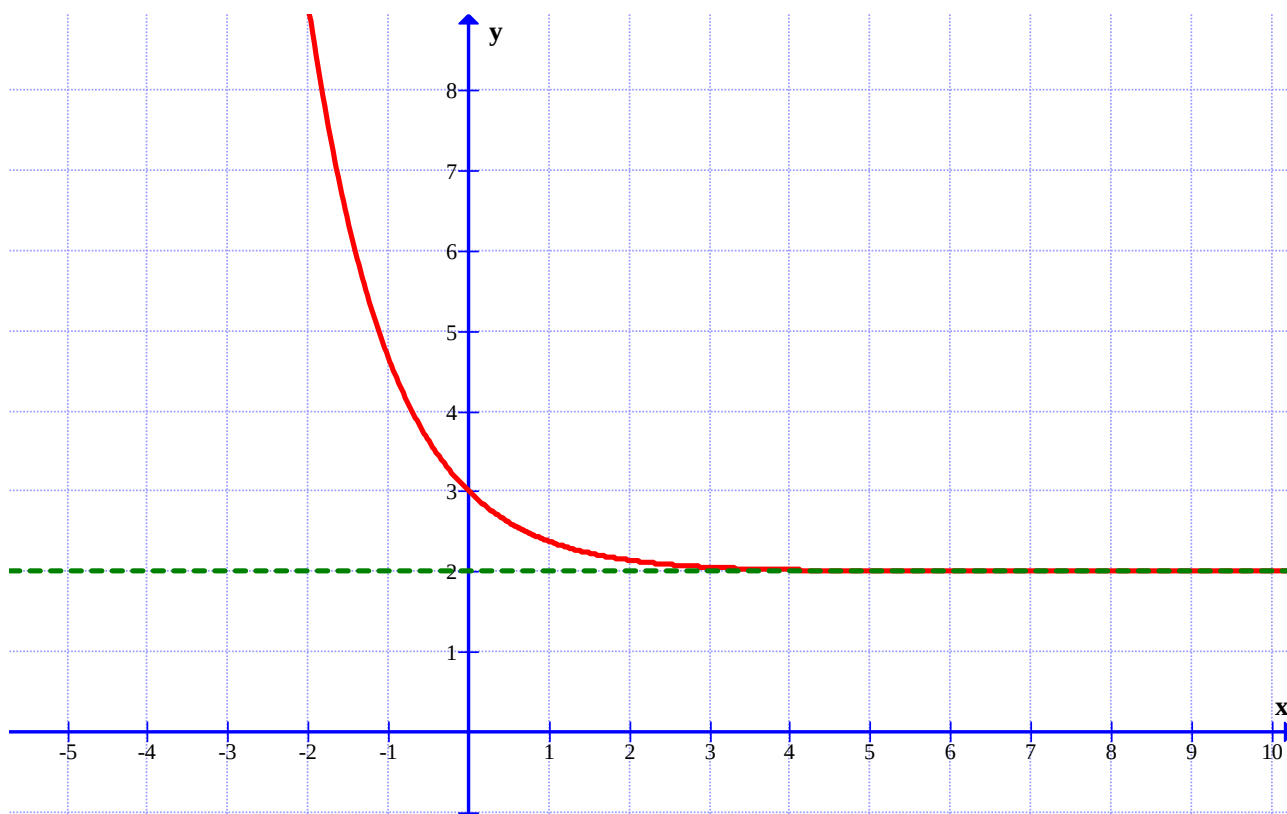
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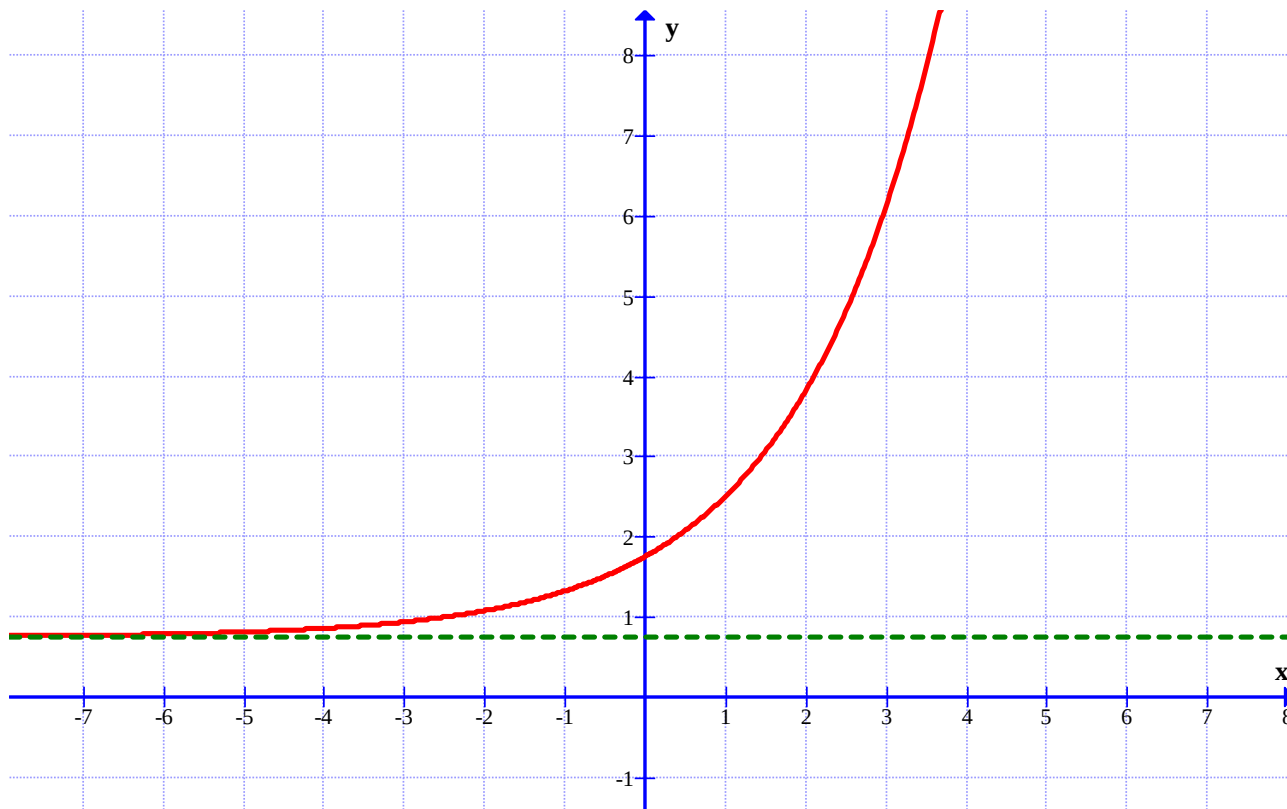
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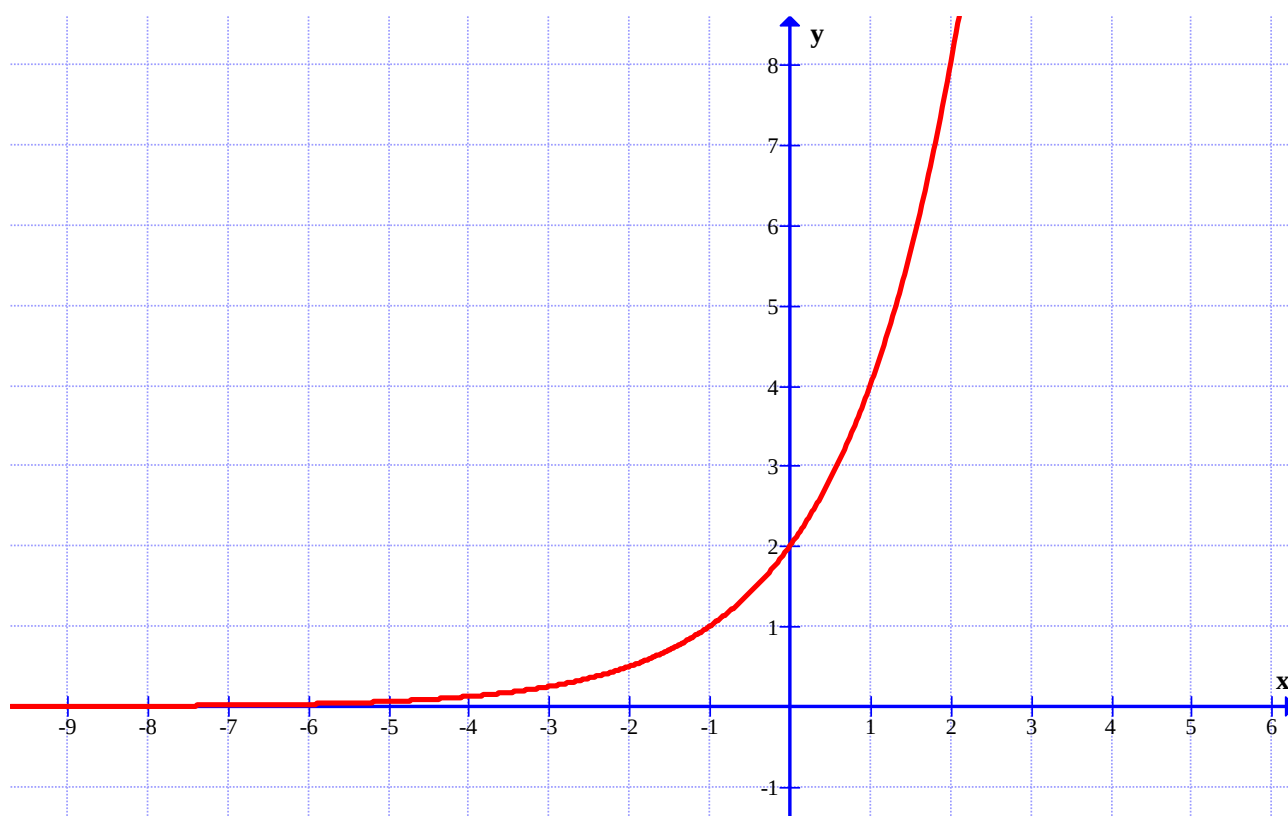
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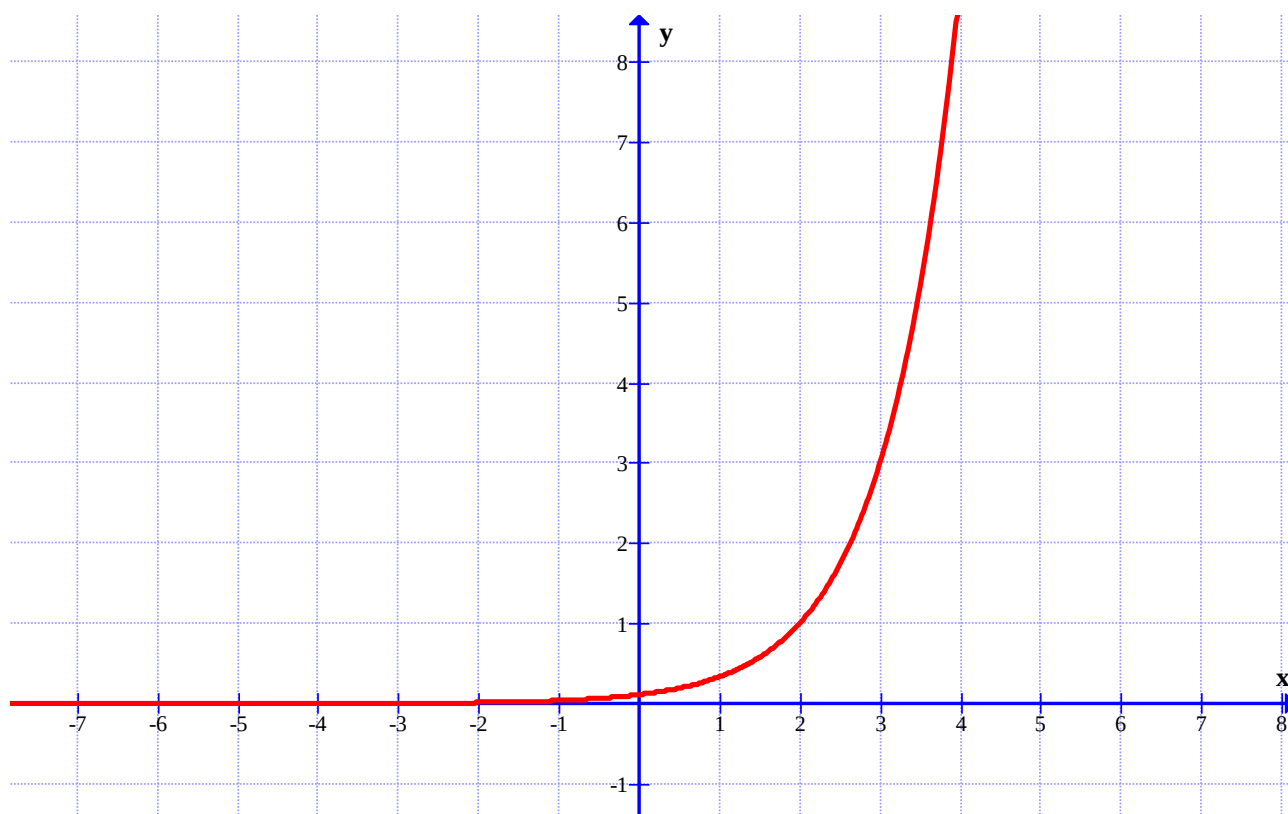
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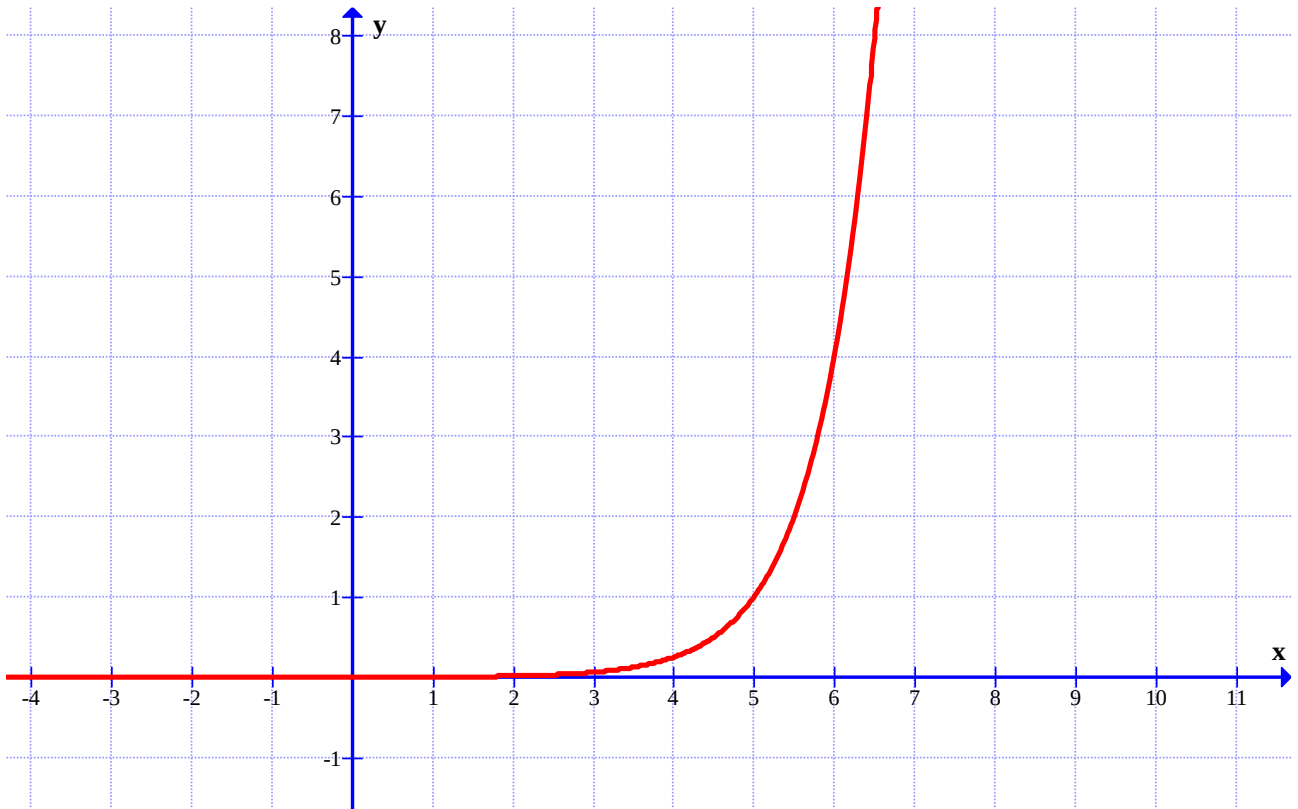
4) a)



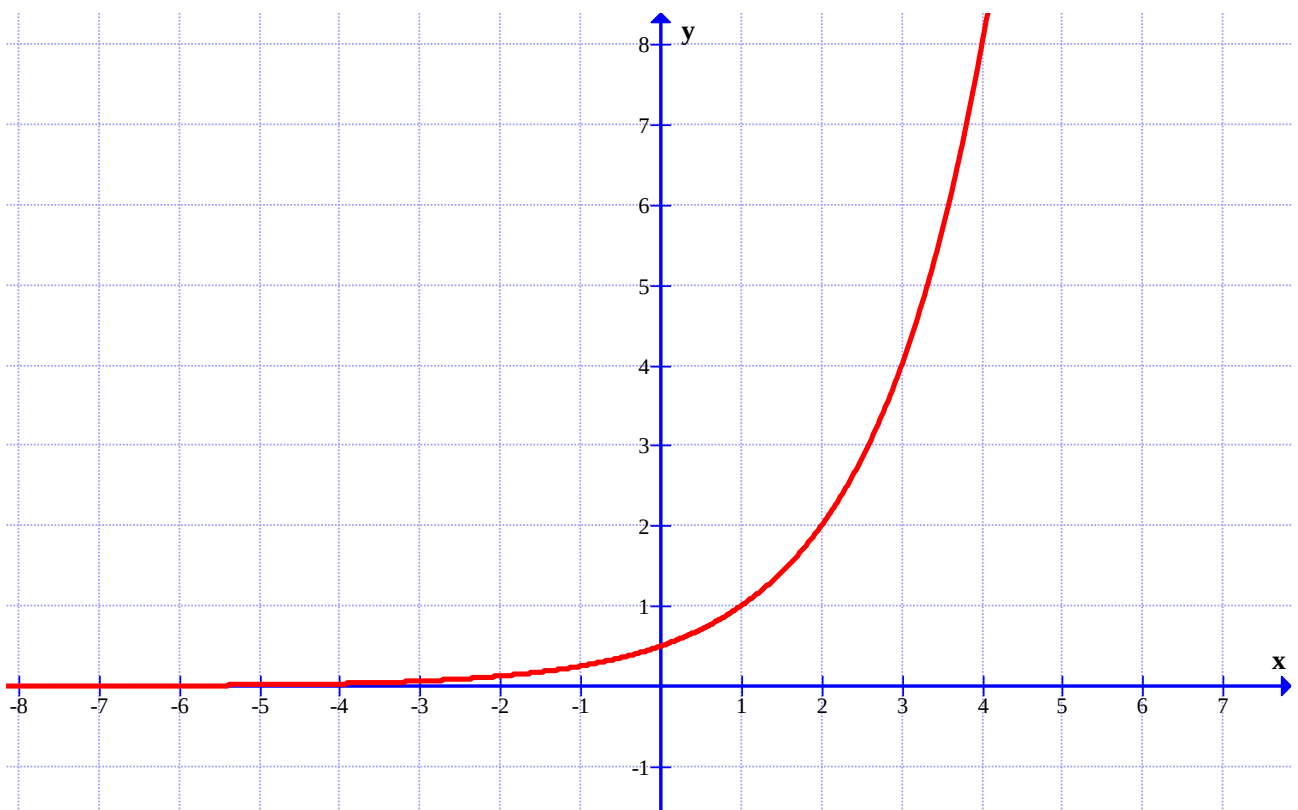
b)



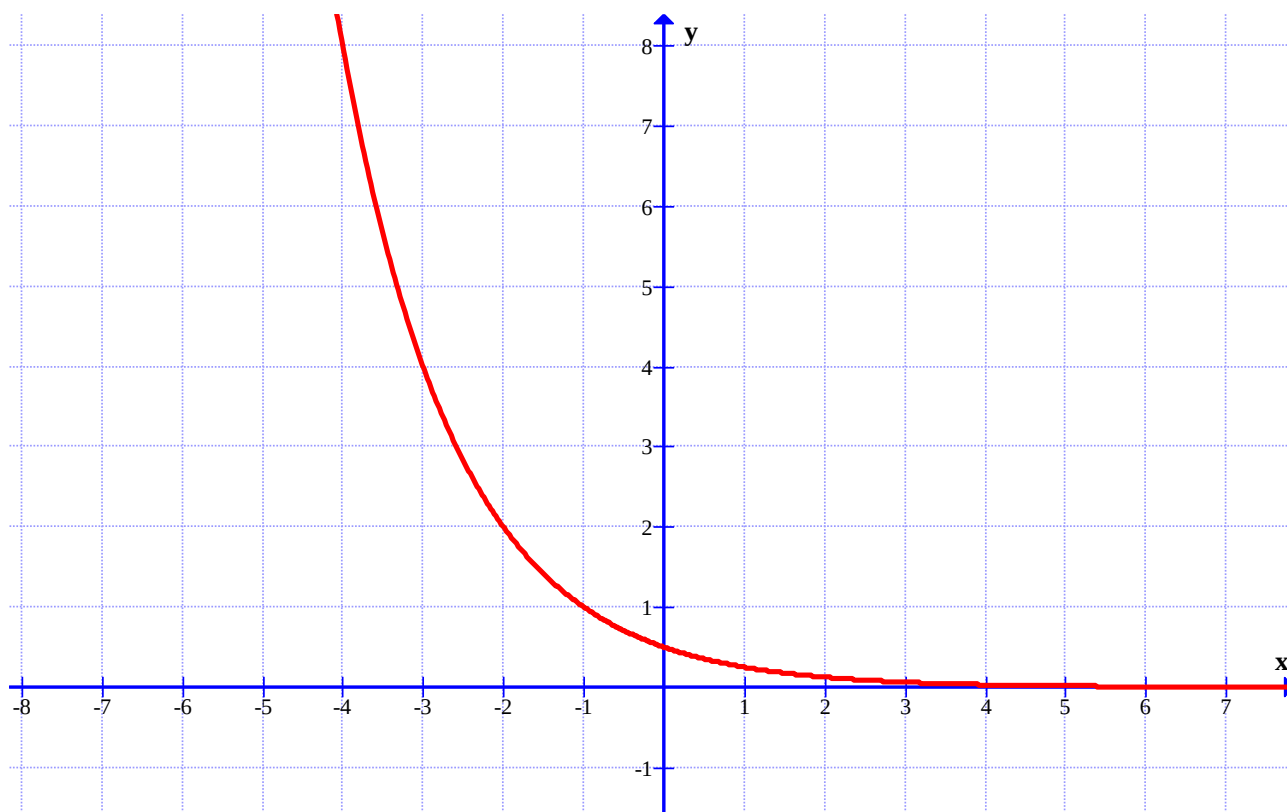
c)



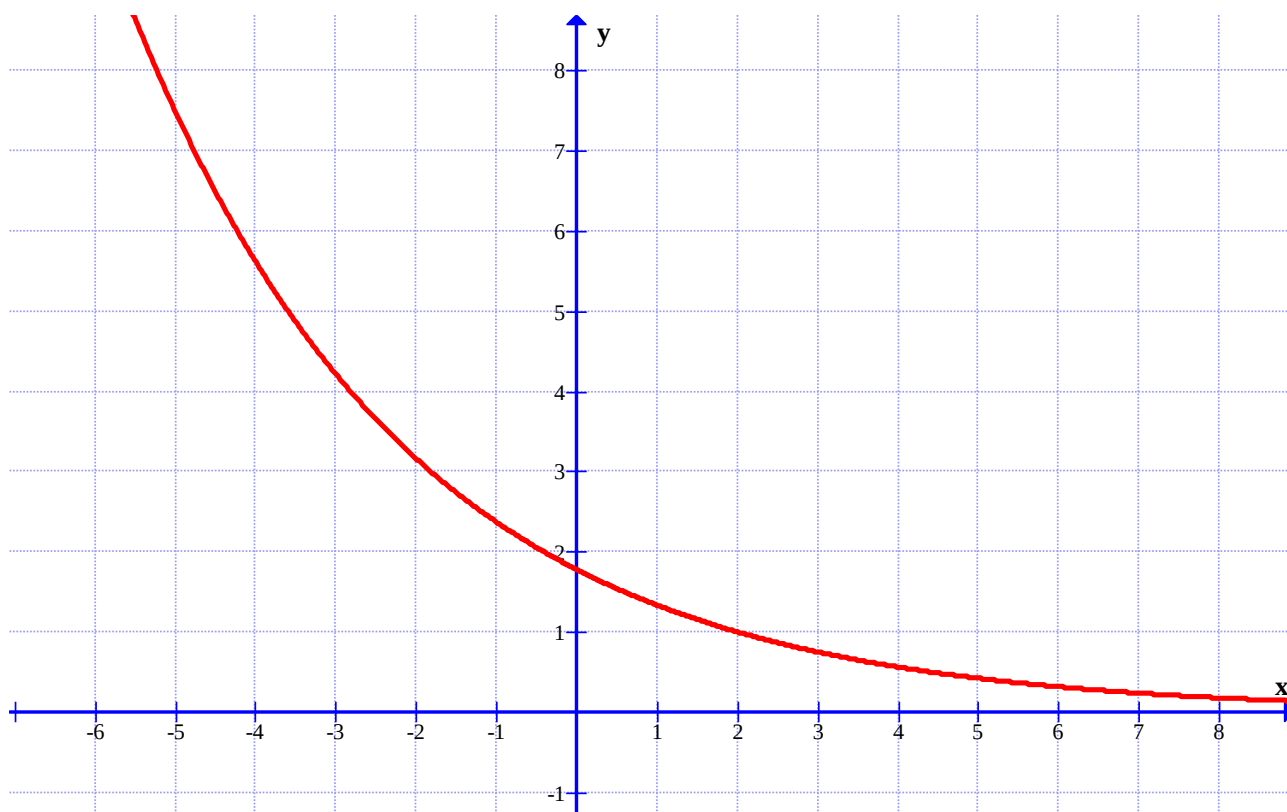
d)



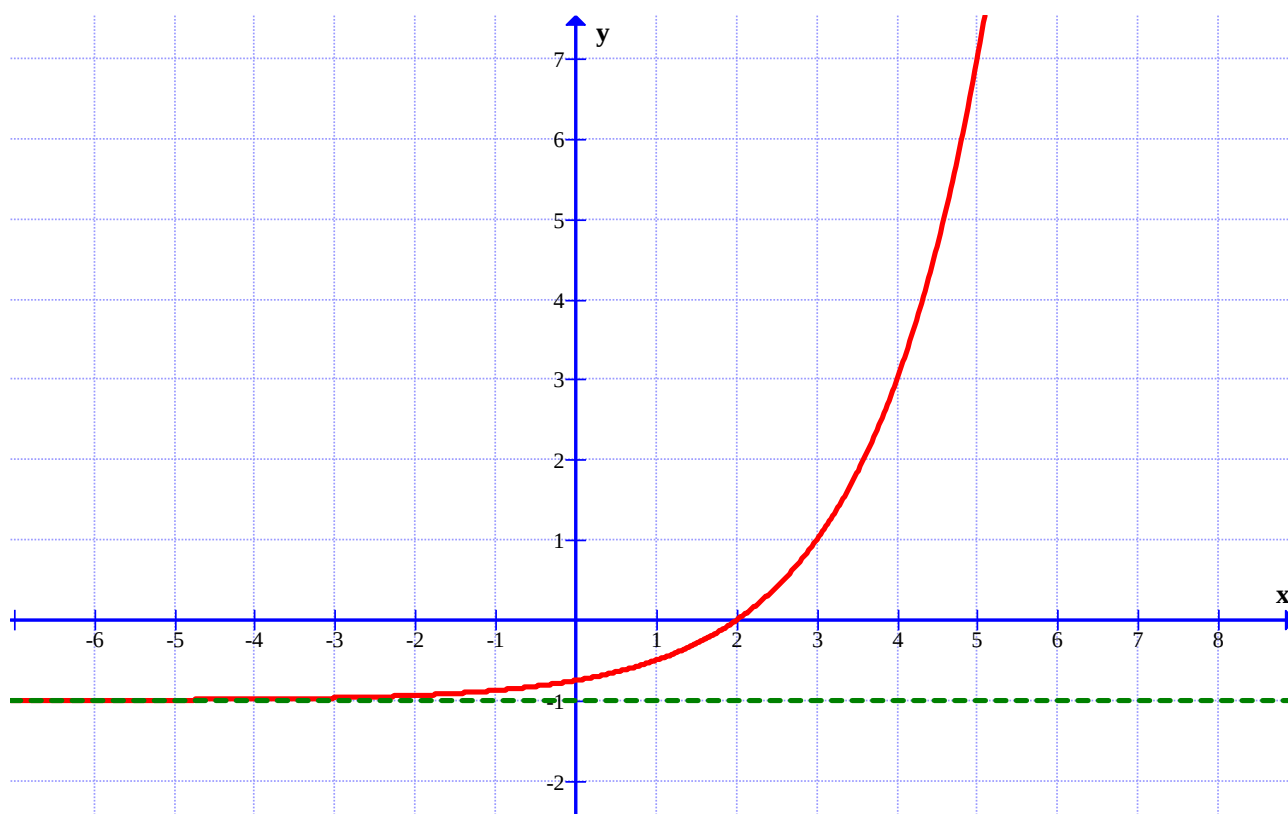
e)



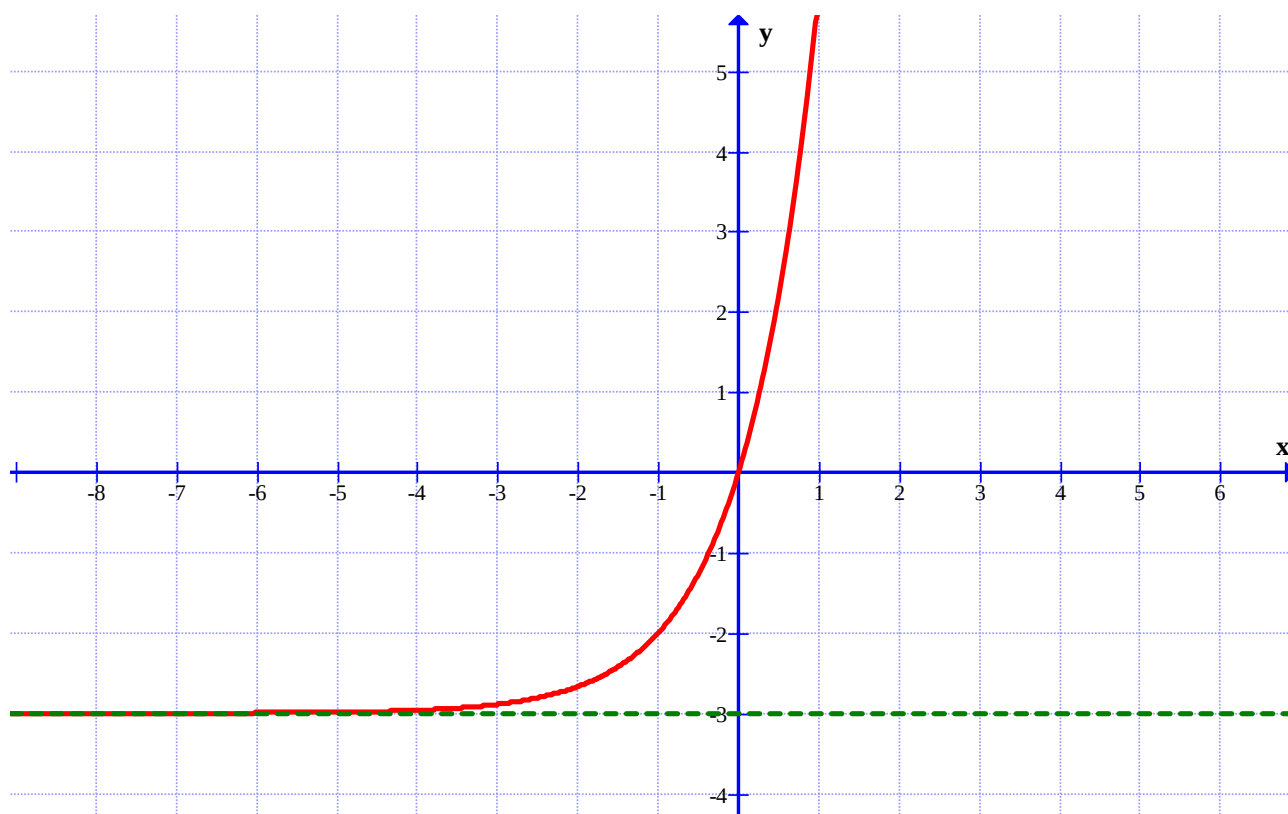
f)



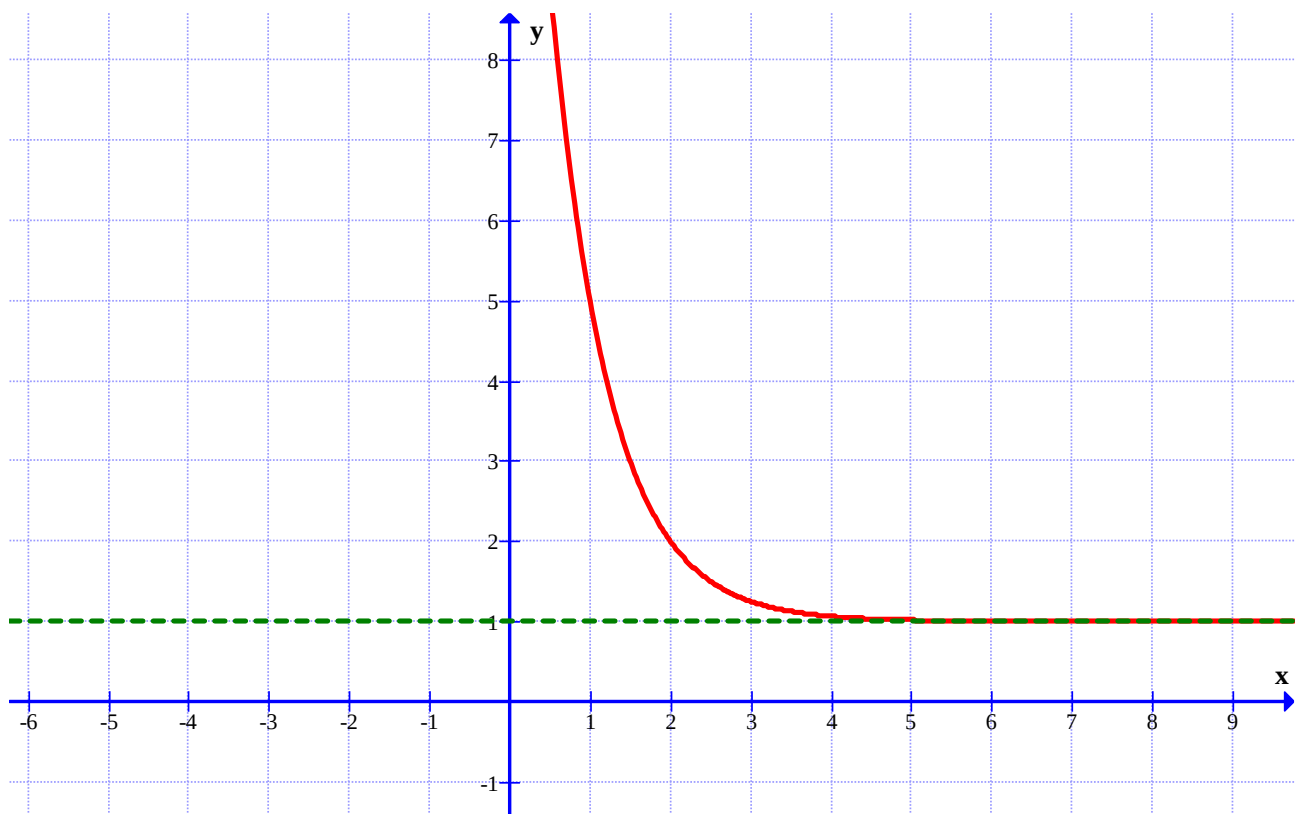
5) a) ničla: $x = 2$, ZV: $A(0, -\frac{3}{4})$, $y = -1$



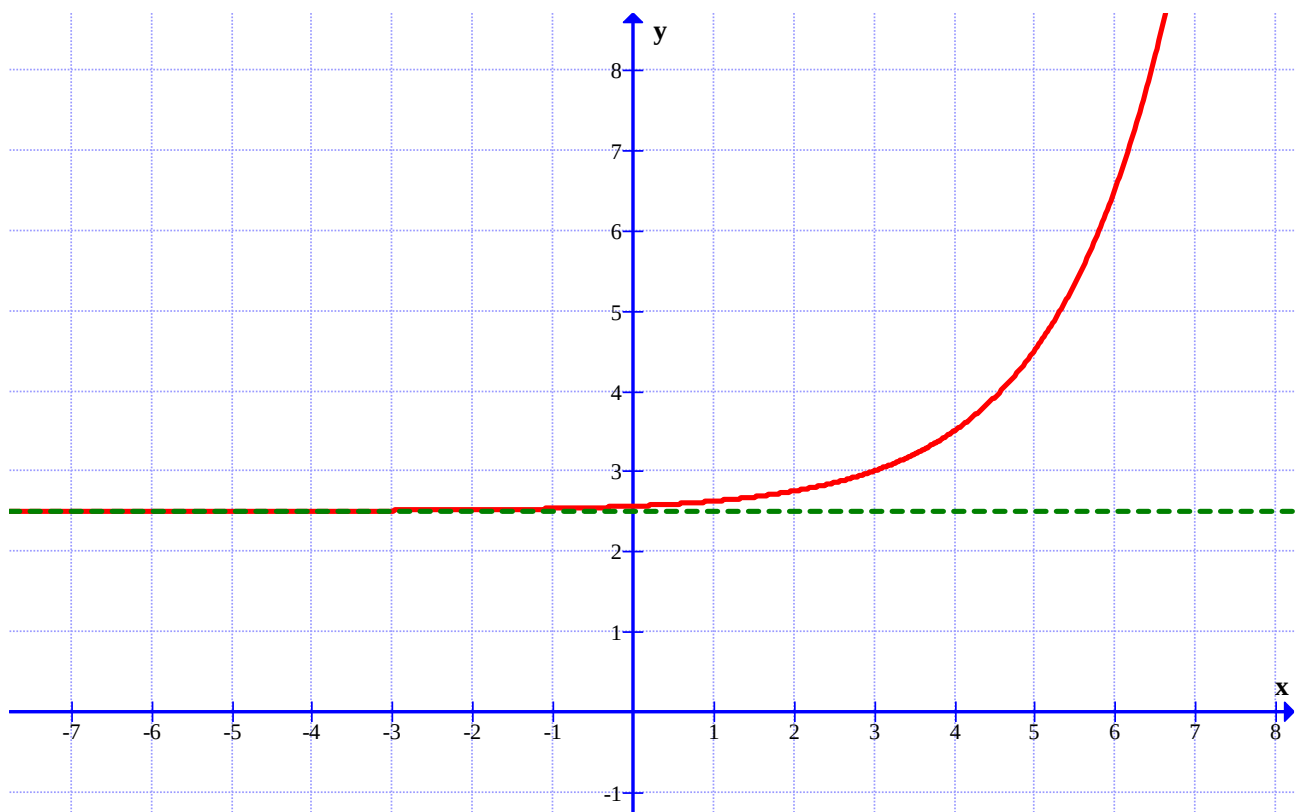
b) ničla: $x = 0$, ZV: $A(0, 0)$, $y = -3$



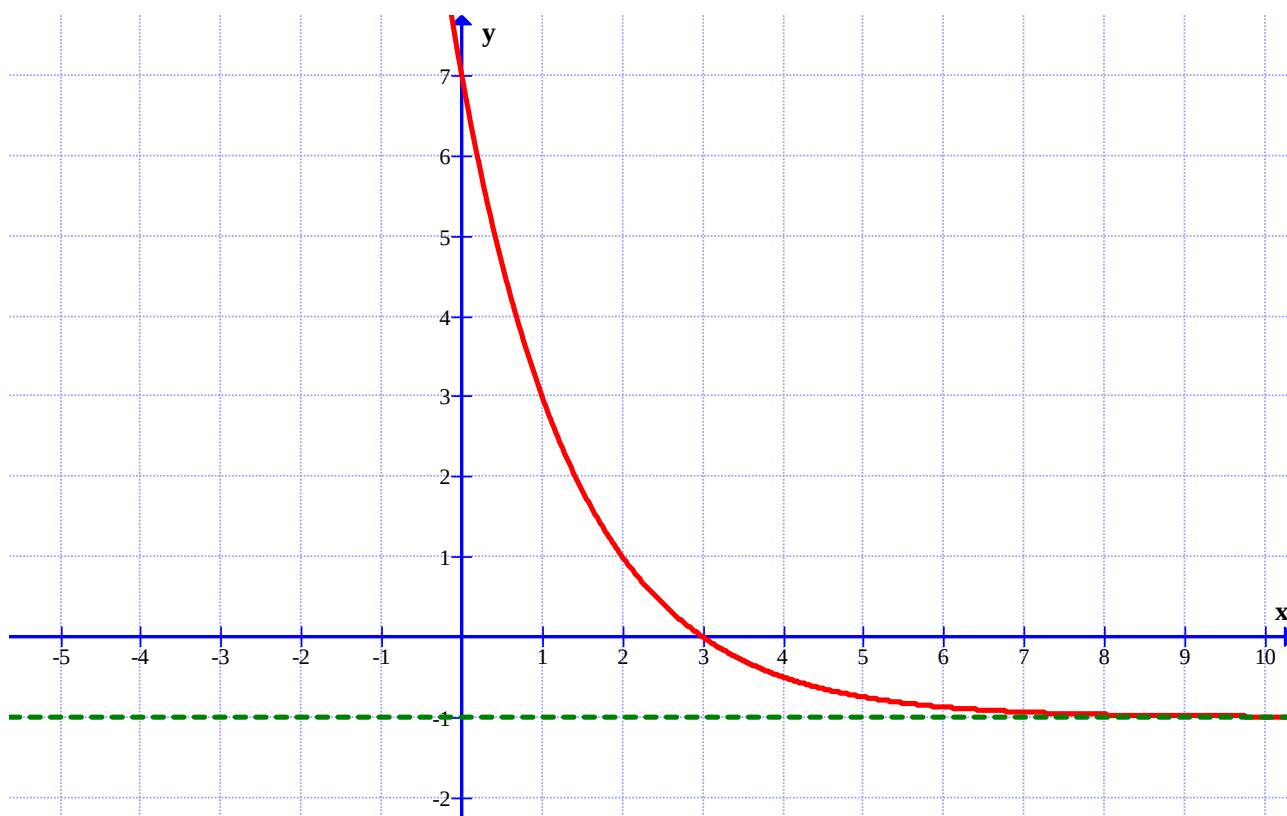
c) ničla: je ni, ZV: $A(0,17)$, $y = 1$



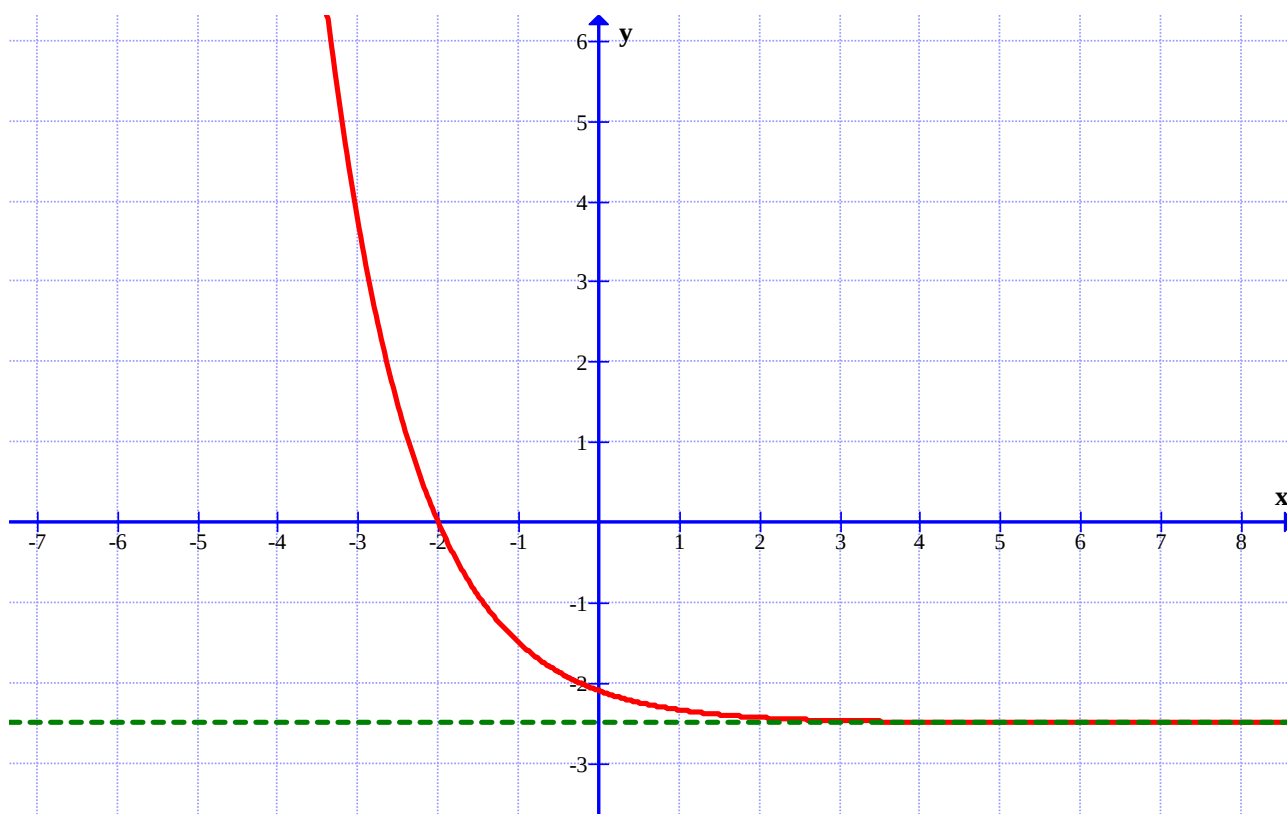
d) ničla: je ni, ZV: $A(0, \frac{41}{16})$, $y = \frac{5}{2}$



e) ničla: $x = 3$, ZV: $A(0,7)$, $y = -1$



f) ničla: $x = -2$, ZV: $A(0, -\frac{21}{10})$, $y = -\frac{5}{2}$



- 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) $x = \frac{3}{2}$
 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) $P(-1, \frac{1}{64})$