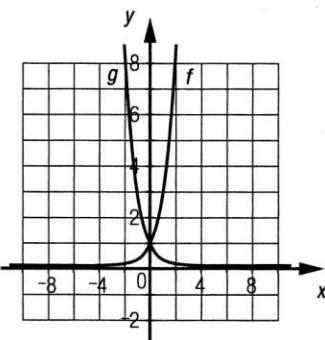


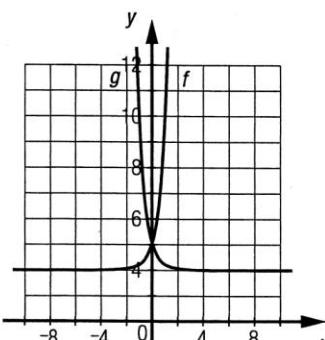
1.

Rule of the function	Domain	Range	Initial value	Variation	Equation of the asymptote
a) $y_1 = 3\left(\frac{1}{5}\right)^x$	\mathbb{R}	$]0, +\infty[$	3	Decreasing	$y = 0$
b) $y_2 = 2.5^x$	\mathbb{R}	$]0, +\infty[$	1	Increasing	$y = 0$
c) $y_3 = 3(5)^{x-3} + 1$	\mathbb{R}	$]1, +\infty[$	1.024	Increasing	$y = 1$
d) $y_4 = 4(0.3)^{-(x-4)} + 2$	\mathbb{R}	$]2, +\infty[$	2.0324	Increasing	$y = 2$
e) $y_5 = 2.5(1.01)^{12x}$	\mathbb{R}	$]0, +\infty[$	2.5	Increasing	$y = 0$
f) $y_6 = 3000(0.95)^{\frac{x}{6}}$	\mathbb{R}	$]0, +\infty[$	3000	Decreasing	$y = 0$

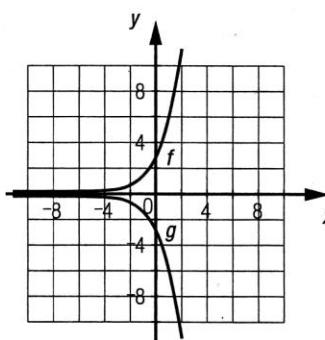
2. a) 1)



2)



3)



- b) 1) A reflection about the y -axis.
2) A reflection about the y -axis.
3) A reflection about the x -axis.

3. a) Decreasing.
d) Increasing.

- b) Increasing.
e) Increasing.

- c) Decreasing.
f) Increasing.

4. a) 1) Domain: \mathbb{R} , range: $]-250, +\infty[$.
3) This function is decreasing.

- 2) ≈ -249.99
4) $y = -250$

- b) 1) Domain: \mathbb{R} , range: $]-\infty, 1.28[$.
3) This function is increasing.

- 2) 0
4) $y = 1.28$

- c) 1) Domain: \mathbb{R} , range: $]-207.36, +\infty[$.
3) This function is increasing.

- 2) -87.36
4) $y = -207.36$

- d) 1) Domain: \mathbb{R} , range: $]-\infty, 337.5[$.
3) This function is decreasing.

- 2) ≈ 324.33
4) $y = 337.5$

- e) 1) Domain: \mathbb{R} , range: $]-10\ 711.05, +\infty[$.
3) This function is increasing.

- 2) -211.05
4) $y = -10\ 711.05$

- f) 1) Domain: \mathbb{R} , range: $]-32, +\infty[$.
3) This function is decreasing.

- 2) 4064
4) $y = -32$

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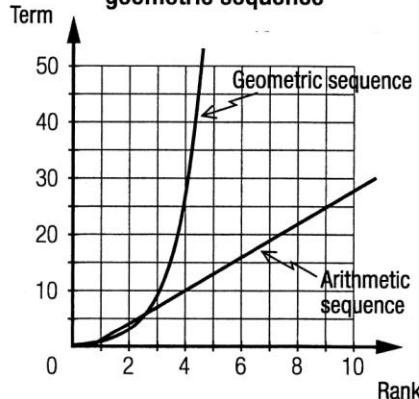
5. a) $f(x) = 2(3)^x + 2$ b) $f(x) = 25(5)^x - 2$ c) $f(x) = -25(0.2)^x + 1$
 d) $f(x) = 32(0.5)^x - 8$ e) $f(x) = 1.5(2)^x - 1$ f) $f(x) = -32(0.5)^x - 8$
6. a) 1) $f(x) = 4(6)^x$ 2) $f(x) = 3(1.5)^x$ 3) $f(x) = -3^x$ 4) $f(x) = 2(0.5)^x$
 b) 1) $f(x) = 3(2)^x + 7$ 2) $f(x) = 10(5)^x - 15$ 3) $f(x) = 0.5(10)^x + 300\,000$ 4) $f(x) = 3(4)^x - 5$

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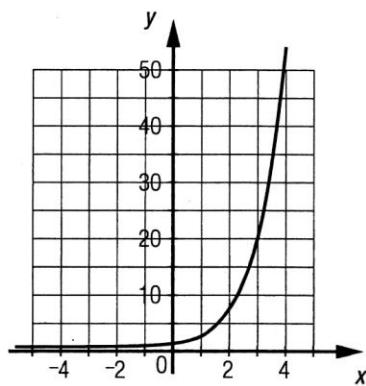
7. a) 1) $(f \times g)(x) = -0.25(2)^{4x+5}$

b) 1) Domain: \mathbb{R} , range: $]-\infty, 0[$.

8. a) **Arithmetic sequence and geometric sequence**



9. a)



2) $\left(\frac{f}{g}\right)(x) = -4(2)^{2x-5}$

2) Domain: \mathbb{R} , range: $]-\infty, 0[$.

b) Arithmetic sequence: first-degree polynomial function,
geometric sequence: exponential function.

c) Arithmetic sequence: $y = 3x - 2$,
geometric sequence: $y = 3^{x-1}$ or $y = \frac{1}{3}(3)^x$.

10. $5400 \times 1.036^{10} \approx \$7,691.15$

b) $y = 0$

- c) 1) Domain: \mathbb{R} , range: $]0, +\infty[$.
 2) This function is increasing.
 3) The initial value is 1.

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11. a) \$26,500

b) $\frac{26500}{25000} = 106\%$

c) $25000 \times 1.03^2 = \$26,522.50$

d) $\frac{26522.50}{25000} = 106.09\%$

e)

Plan A				Plan B			
Time (months)	Time (years)	Calculation	Value of investment (\$)	Time (months)	Time (years)	Calculation	Value of investment (\$)
0	0	$25000(1.06)^0$	25,000	0	0	$25000(1.03)^0$	25,000
12	1	$25000(1.06)^1$	26,500	6	0.5	$25000(1.03)^1$	25,750
24	2	$25000(1.06)^2$	28,090	12	1	$25000(1.03)^2$	26,522.50
36	3	$25000(1.06)^3$	29,775.40	18	1.5	$25000(1.03)^3$	≈ 27,318.18
48	4	$25000(1.06)^4$	≈ 31,561.92	24	2	$25000(1.03)^4$	≈ 28,137.72
...	30	2.5	$25000(1.03)^5$	≈ 28,981.85
				36	3	$25000(1.03)^6$	≈ 29,851.31
				42	3.5	$25000(1.03)^7$	≈ 30,746.85
				48	4	$25000(1.03)^8$	≈ 31,669.25
			
	x	$25000(1.06)^x$		x		$25000(1.03)^{2x}$	

f) Investment B is the most advantageous because in this plan, the second portion of the 3% interest is calculated on an amount to which 3% has already been added.

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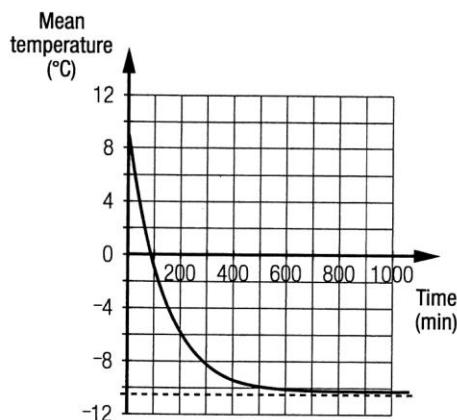
12. a) 1) $13.5V$

2) $\approx 3.50V$

b) This function is decreasing.

c) Domain: $[0, 216]$ days, range: $[4.87 \times 10^{-8}, 13.5]V$.

13. a) Mean temperature inside a freezer as a function of time



b) 1) $y = -10.5$

2) Even if theoretically this temperature would never be reached, it is the "minimum" temperature of the freezer.

c) $[-10.5, 9]^\circ C$

d) $9^\circ C$

14. a) $p \approx 10^d$

b) The opacity is approximately 316.23 units.

c) No, because it refers to an exponential function where the equation of the asymptote is $y = 0$; this means that the value of the opacity will approach 0 but never reach it.

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15. a) $\approx 29.53\%$

b) $\approx 50.34\%$

c) $\approx 82.62\%$

16. $V = V_0(1.005)^{3x}$ where V_0 represents the initial value of the investment.

17. Approximately 1197 frogs will be left.

18. a) $I = (1.02)^x$ where I represents the interval (in h) between each cigarette smoked and x represents the number of days elapsed since the start of the process.

b) 1) ≈ 1.15 h or ≈ 1 h 9 min. 2) ≈ 1.81 h or ≈ 1 h 49 min. 3) ≈ 19.5 h or ≈ 19 h 30 min.