Exercise 1	Calc. : 🗸
Use the calculator for questions b), c), d), e), f), h), i), j) and m)	
Frog and Toad. Arnold Lobel. 1970–1979	
The value of a bicycle, in euros, depending on the time t in years, can be described by the function f given $f(t) = 750 + 2\ 250 \cdot e^{-0.2t}$.	
a) Calculate the value of the bike when new.	1 mark
b) Calculate the value of the bike after one year, and after three years.	2 marks
c) How much does the bicycle lose in value in the first year? Round to the nearest 1.	1 mark
d) By what percentage has the value of the bicycle decreased after three years? Round to the nearest 1%.	3 marks
e) Solve the equation $f(t) = 1$ 500 and interpret the result.	3 marks
f) Determine value of the bicycle in the long-term based on this model.	2 marks
g) Calculate the derivative $f'(t)$.	2 marks
h) Calculate $f'(5)$ and interpret the result.	2 marks

				Tan	dem, Ma	rke Will	iam, 195					
A 48	$8 \text{ cm}^3 \text{ p}$	etrol eng	gine is m	ounted o	on the bio	eycle.						
The	fuel co	nsumptio	on, meas	ured in $\frac{1}{25}$	iters for 1	100 km, o	can be ca	lculated	as a func	ction of t	the speed	
usin	g the f	unction h	u(x) = 0.0	$4x + \frac{25}{x}$,	where x	is the sp	beed in k	m/h.				
i)	Graph	the func	tion h fo	or $5 \le x \le$	$\leq 50 \text{ using}$	g the foll	lowing ta	ble of va	lues.			2 marks
,						-	_					
	x h(x)	5	10	15	20	25	30	35	40	45	50	
	Round Graph	the func paper is	etion valu available	ues to on 2.	e decima	l place.	I					
j)	j) Calculate the petrol consumption at 25 km/h in liters for 100 km.								$1 \mathrm{mark}$			
k)	Read f	rom you	r graph,	for which	h speed,	x, the fu	el consur	nption is	the leas	t.		2 marks
l)	l) Calculate an antiderivative for the function h .								2 marks			
m)	m) The bike is pushed and drives off at a speed of 5 km/h. It is then steadily accelerated to 50 km/h.							2 marks				
Calculate the integral $\int_{5}^{50} h(x) dx$ with the calculator. Round to the nearest whole number.												
Ren	nark (tł	nis is not	t a quest	ion!): T	he value	$\frac{1}{45}\int_{5}^{50}h$	h(x) dx is	the ave	rage fuel	consum	ption per	
100	$km \ wh$	en accele	rating fr	om 5 km	h to 50	$km/\check{h}.$						

Exercise 2	Calc. : 🗸				
Use the calculator for questions a, b, c, d, e, g, i, and k.					
Round your numerical answers to the nearest whole number.					
Jane is starting an online business, using a large social media base to promote her website.					
The weekly visits to her website over the first year can be modelled by the following function:					
$f(t) = 15 \cdot \ln(3t+1)$, where $f(t)$ represents the number of hundreds of visitors her website got and					
t represents the time measured in weeks with $0 \le t \le 52$.					
a) Calculate the number of visitors the website got in the first week, and the number of visitors the website got in the last week of the year.	2 marks				
b) Calculate the total number of visits to the website in the first three weeks.	2 marks				
c) How long did it take for her to pass 20 000 visits in total from the moment she launched her website?	4 marks				
d) Calculate the integral $\int_0^{26} f(x) dx$ with the calculator and interpret the result in the given situation.	3 marks				
e) Calculate $f'(26)$ to 2 decimal places and interpret the result.	3 marks				
Jane assumes that the rate of change will remain stable from week 26, and the number of visitors will now grow at the constant rate $m = 0.6$. It models the number of visitors (in hundreds) for $26 \le t \le 52$ with the function $g(t) = 0.6 \cdot t + 50$.					
f) Explain how Jane came up with this equation to model future growth.	2 marks				
g) Calculate how many visitors Jane is expecting in the last week of the year using this new model.	1 mark				
h) Write an integral that allows to calculate the total number of visits during the last 26 weeks.	2 marks				

In reality there were 7820 visitors in the last week of the first year.	l
i) Which of the two models turns out to be better for predicting this number?	2 marks
One of the objects Jane sells on her website is a mic-stand base. Its profile can be modelled using	l
the function $h(x) = \frac{4}{0, 5x - 1, 4}$ on the interval $-5 \le x \le 2$. Each unit on x and y axis represents	1
j) Write the integral required to calculate the volume of revolution using the formula $V = \int_{a}^{b} \pi (f(x))^{2} dx.$	2 marks
k) Calculate the volume of metal used to make the mic-stand base, in cubic centimeters, to the nearest cm ³ .	2 marks