Math Studies study guide

name_____
period ___

1) If $g(x) = 5^{-x}$, find:

a $g(1)$ b $g(3)$ c $g(0)$ d $g(-2)$ e $g(-3)$

a) $5^{-1} = \frac{1}{5}$ b) $5^{-3} = \frac{1}{5^3} = \frac{1}{125}$ c) $5^0 = 1$ d) $5^{-2} = 25$ e) $5^3 = 125$

2) Given $f(x) = 4\,(1/2)^x + 3$

a) identify the y-intercept (0, 7) let $x = 0$

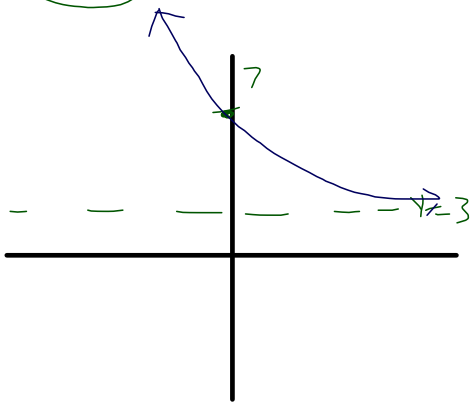
b) identify the horizontal asymptote $y = 3$

c) identify the equation as exponential growth or decay _____

d) as $x \Rightarrow \infty$, $y \Rightarrow$ 3 ($x \to -\infty$, $y \Rightarrow \infty$)

e) sketch the curve on axis below

(label appropriate parts)



3) Solve each equation: (show how to solve for (t) by hand)

a) $4^t = 200$

$\ln 4^t = \ln 200$

$t \ln 4 = \ln 200$

$t = \frac{\ln 200}{\ln 4} = 3.82$

a)_____

b) $720\,(1/3)^x = 120$

$\log \frac{1}{3}^x = \log \frac{1}{6}$

$x \log \frac{1}{3} = \log \frac{1}{6}$

$x = \frac{\log \frac{1}{6}}{\log \frac{1}{3}} = 1.63$

b)_____

4) The value of a car depreciates according to the formula $C(t) = 4500 \times (0.68)^{t} + 500$ euros, where t is the age of the car in years.

a Sketch a graph of $C(t)$ against t.

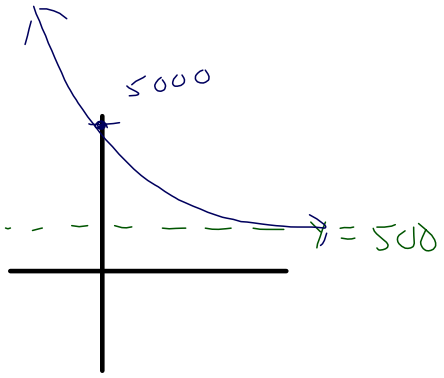
b What was the initial cost of the car?

c How much is the car worth after $4\frac{1}{2}$ years?

d State the equation of the horizontal asymptote of $C(t)$. What does this mean?

e How long will it take for the car's value to drop to €1000?

a)



b) $C(0) = 5000$

c) $C(4.5) = 1293.42$

d) $y = 500$

e)

$1000 = 4500 \times (.68)^{t} + 500$

$500 = 4500 \cdot (.68)^{t}$

$\frac{1}{9} = (.68)^{t}$

$\frac{\ln\left(\frac{1}{9}\right)}{\ln(.68)} = t$

$t = 5.69727$

5 years 8 months