Lesson # 7 Assignment

① Use the Inverse to Calculate the side length (to the nearest tenth of a centimeter) for a Cube with volume of $750\,cm^3$.

Volume of Cube $= s^3$.

$750\,cm^3 = s^3$

$\sqrt[3]{s^3} = \sqrt[3]{750\,cm^3}$

$s = 9.085760\,cm$.

To the nearest tenth of centimeter $= 9.1\,cm$.

2 (a) Determine an equation to model the relation.

$y = A(d)^x$

$y = 12{,}000(1 - 0.08)^x$.

(b) Use the equation to determine machine's value 6 yrs after the purchase

$y = 12000(1 - 0.08)^t$

$y = 12000(1 - 0.08)^6$

$y = 12000(0.606355)$

$y = 7{,}276.26$

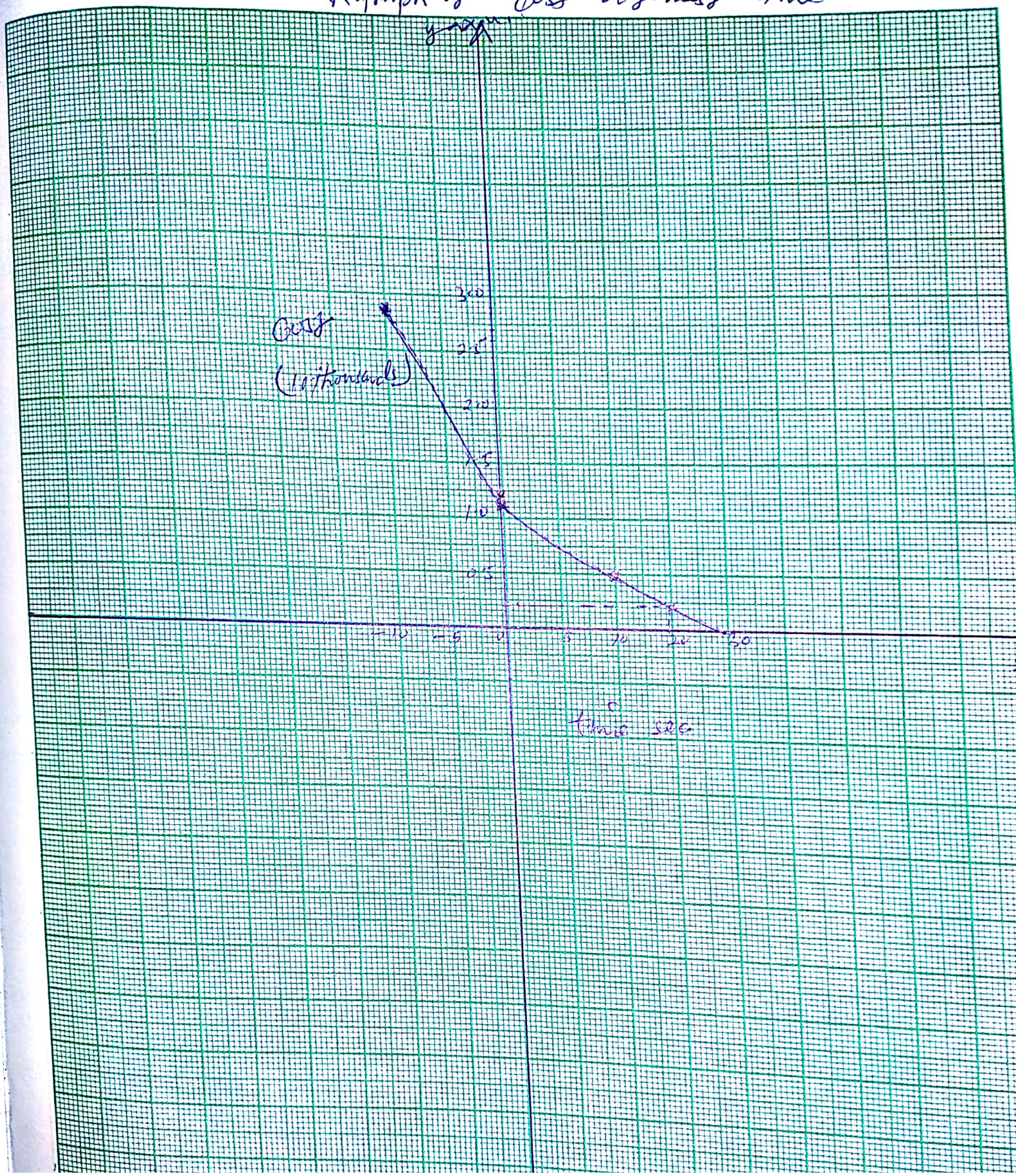
$= \$\ 7{,}276.26$.

(c) Use desmos to create Graph of the relation that shows value for atleast 30 years

$y = 12000(1 - 0.08)^t$

t	y
-10	27625
0	12000
10	5212.66
20	2264.3

A graph of cost against time



= Graph Drawn.

d Use the graph to estimate when machine will have $ 2000

20 years.

③ (a) Use the graph to estimate how many years it will take for the world's population to reach ~~50 years~~ Using the ~~data~~ 8 billion people. State the Callender year to which this corresponds.

= 12.5 years

the Callender year ⇒ 2014 + 12.5 years.

2014
12.5

2026.5

Callender year = 2026.

(b) Create exponential equation to model world population.

$TP = P(1+0.01)^n$.

$T_{p.} = 7(1+0.01)^{n\ years}$.

(c) Use the equation to predict the world population in 2054

2054
2014
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40 years.

$= 7(1+0.01)^{40}$

$7(1.01)^{40}$

Total population = $7(1.4886) = 10.42$

≈ 10 billion people.

(4) Solve the exponential equations.

(a) $5(10^x) = 5000$

$10^x = 1000$

$10^x = 1000$ is equivalent to $\log_{10} 1000 = x$

$x = 3.$

(b) $8^{x+5} = 16^{2x}$.

$= 2^{3(x+5)} = 2^{4(2x)}$

$2^{3x+5} = 2^{8x}$

Since bases are the same then,

$3x + 5 = 8x$

$5x = 5$

$x = 1$

(c) $\left(\frac{3}{2}\right)^{5x+1} = \left(\frac{27}{8}\right)^{x-4}$

$= \left(\frac{3}{2}\right)^{5x+1} = \left(\frac{3}{2}\right)^{3(x-4)}$

$\left(\frac{3}{2}\right)^{5x+1} = \left(\frac{3}{2}\right)^{3x-12}$.

Since bases are the same

$5x + 1 = 3x - 12$

$2x = -13$

$x = -\frac{13}{2}$