Please put away all papers and electronic devices except for a calculator. Show enough work that it is clear how you arrived at your answer. Put a box/circle around your final answer to each question, rounded to 4 decimal places unless otherwise specified. Good luck!

- 1. To deliver a package, a particular delivery service charges \$4.50 plus \$0.75 per ounce.
 - (a) (12 points) Find a formula for the total cost y of delivering a package in terms of the number of ounces x the package weighs.

$$\frac{x}{\sqrt{9}}$$

0 4.50 + INITIAL VALUE = 4.50

1 5.25

2 6.00) NATE OF CHANGE $m = \frac{\Delta y}{\Delta x} = \frac{.75}{1} = .75$

3 6.75

 $y = 4.50 + .75 \times$

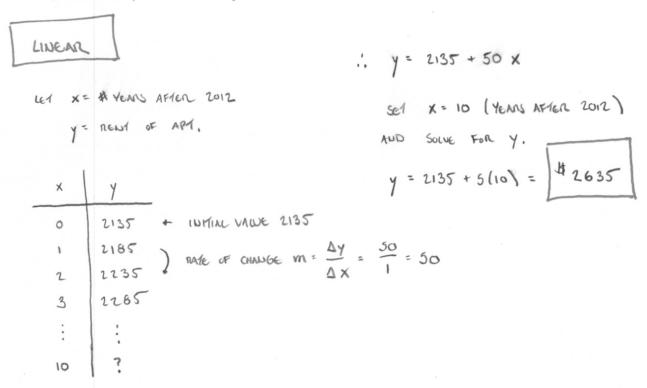
(b) (8 points) How much does it cost to deliver a package that weighs 4.2 ounces?

SET
$$X = 4.2$$
 AND SOLUE FOR Y .
$$Y = 4.50 + .75(4.2) = 4.50 + 3.15 = 7.65$$

(c) (8 points) What is the heaviest weight package you can afford to have dlivered for \$15?

SET
$$y = 15$$
 AND SOLVE FOR X.
 $15 = 4.50 + .75 \times$
 $10.50 = .75 \times$
 $x = \frac{10.50}{.75} = 14$ 14 OUNCES

- 2. State whether the growth/decay is linear or exponential and answer the question.
- (a) (12 points) The rent of an apartment increases by \$50 each year. If the rent for this apartment is \$2135 in 2012, find the monthly rent in 2022.



(b) (12 points) The average concentration of carbon dioxide in the Earth's atmosphere is increasing by 0.55% each year. If the average concentration was 405.5 parts per million (ppm) in 2017, find the average concentration in 2050.

EXPONENTIAL

$$y = 405.5 (1.0055)^{\times}$$

Let $x = \frac{1}{4}$ YEARS AFTER 2017

 $y = AVE$. CODC. OF CO2

 $x = 405.5 (1.0055)^{33}$
 $y = 405.5 (1.0055)^{33}$

3. (12 points) The population size of a certain colony of bacteria is observed to double every 3 hours. If there are 260 bacteria in the colony at 10 am, find the number of bacteria in the colony at 6pm, rounded to the nearest integer.

Let
$$X = 4$$
 Huns Past 10 am $y = A(2)$

$$Y = Population$$

$$T_2 = 3$$

Sc1
$$x = 8$$
: $y = 260(1) \approx 1651$

4. (12 points) The half-life of a drug in the human blood-stream is 16 hours. If 50 mg of the drug is injected into a patient, how much of the drug remains after 24 hours?

Let
$$X = \# \text{ Hours AF16R IN-Section}$$
 $y = m_0 \text{ of DRU6 IN BLOOD STREAM}$
 $y = A(\frac{1}{2})^{-1/2}$
 $A = 50$
 $T_{12} = 16$
 $y = 50(\frac{1}{2})^{-1/6}$

Set $X = 24$: $y = 50(\frac{1}{2})^{-1/6} \approx 17.6777$ m₀

5. (a) (12 points) Assume that y is a linear function of x and fill in the following table of values.

(b) (12 points) Assume that y is an exponential function of x and fill in the following table of values.

x	l v		
	y		
0	100)	× 1.05
1	105		
2	110.25		× 1.05
3	115.7625		×1.05
4	121.550625	•	×1.05
5	127.6281563	2	×1.05