WORKSHEET #8
Math 6A20, Fall 2020

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Instructions. You are encouraged to work with **(not copy)** your group, but each of you will turn in your own worksheet by the end of the day (11:59 pm) via Gradescope. You may ask the TA a few questions, which the TA will answer with leading questions (not answers) to help guide you.

Log in to www.Gradescope.com with your UCRNetID@ucr.edu email to submit your worksheet.

Instructions for clear submissions. If you can, write on the worksheet. If you cannot, then write your solutions to page 1 of the worksheet on one paper and your solutions to page 2 of the worksheet on a second paper. Clearly label each question. **Scan** your work with a scanning tool to **pdf** and upload it to Gradescope. **Your submission should be clear, easy to read, no shadows with each of your pages submitted to the correct page on Gradescope.** If it is not, then resubmit. Worksheet is **15** points *(-2 for unclear submissions).*

Question 1 (2 points) Let $f(t) = 50(0.95)^t$. *Each part is worth 1 point.*

(a). From $t = 0$ to $t = 1$, what is the (i) portion, (ii) percent, and (iii) percent change for $f(t)$?

Portion : $f(t) = 50(0.95)^t$

Percent : $0.95 \cdot 100 = 95\%$

Percent change : $100 - 95\% = 5\%$

(b). From t to $t+1$, what is the (i) portion, (ii) percent, and (iii) percent change for $f(t)$?

Portion : $\frac{f(t+1)}{f(t)} \rightarrow \frac{f(50(0.95)^{(t+1)}}{f(50(0.95)^t)} \rightarrow$ Percent : $100 - .95 = 95\%$

% change : $100 - 95 = 5 \rightarrow 5\%$

Question 2 (4 points) Let $g(t)$ be the amount George has in his bank account t years after his initial deposit of \$80 on January 1, 2020. Assume George's account always earns 3% each year an no money besides interest is added to his account. *Each part is worth 1 point.*

(a). From $t = 0$ to $t = 1$, what is the (i) portion, (ii) percent, and (iii) percent change for $g(t)$?

$t = 0$ $g(0) = 80$ $t = 1$ $g(1) = 80.03$

Portion : $\frac{80.03}{80}$ Percent : 3%

Percent change $100 - 3 = 97\%$

(b). Write an equation for $g(t)$.

$g(t) = 80(0.03)^t$

(c). From t to $t+1$, what is the (i) portion, (ii) percent, and (iii) percent change for $g(t)$?

Portion : $\frac{80.03+1}{80+1}$ Percent change : $100 - 3 = 97\%$

Percent : 3%

(d). Why use the language of portion, percent, and percent change for exponential functions?

To understand how the equation changes

Question 3 (1 point) Jean bought a pair of jeans during the Black Friday sale for $24, which was 40% off of the retail price. What is the normal retail price of Jean's jeans?

Hint: Write down all work to help avoid introducing calculation mistakes. You do not need to evaluate.

$24 — 40% → 48 — $\frac{40}{100} \to 0.4$ — $40

Question 4 (8 point) The tables below give a few values of a function, f.

(a). (2 points) Complete the table assuming f is:

a linear function ⟷ an exponential function

x	-1	0	1	2	3
f(x)	2/3	2	6	18	54

(×3, ×3, ×3, ×3)

x	-1	0	1	2	3
f(x)	-18	-6	6	18	40

(+12, +12, +12, +12)

(b). (1 point) What is the percent change from $x = 1$ to $x = 2$?

$x = 1$, $(1, 6)$ — $\frac{6}{1} = 6$ — $x = 2$, $(2, 18)$ — $\frac{18}{2} = 9$ — $9 - 6 = 3$ — $100 - 3 = 97\%$ — -97%

(c). (1 point) If f is a linear function, what is the equation for f?

$(0, -6)$

$f(x) = 12x - 6$

(d). (2 points) If f is an exponential function, what is the equation for f?

$(0, 2)$

$f(x) = 2(3^x)$

(e). (2 points) Assume f is exponential. Graph f by hand without using a graphing tool. Label carefully, marking the coordinates of at least 3 points from your table on the graph.