11- 2 Electric Utilities

ADVANCED FINANCIAL ALGEBRA

Utilities include gas, water, electricity, phone, trash, cable, internet, etc.

- Gas, water, and electricity are more traditional utilities.
- Increasingly, we have electronic utilities with the growing popularity and availability of cell phones, internet, cable and satellite.

Example #1 - cell phone bill

- Janice's cell phone plan includes 3GB of data and unlimited talk and text. The service costs her $90 per billing period. For the past year, in every other month she uses 3.2GB, and each extra gigabytes of data, or part thereof, costs her $15. If the extra fees and taxes are approximately $29 per billing cycle, what are her average monthly fees for cell phone use?

Solution:

Months under 3GB → 90 + 29 = $119

Months at 3.2GB → 90 + 29 + 15 = $134

6($119) + 6($134)

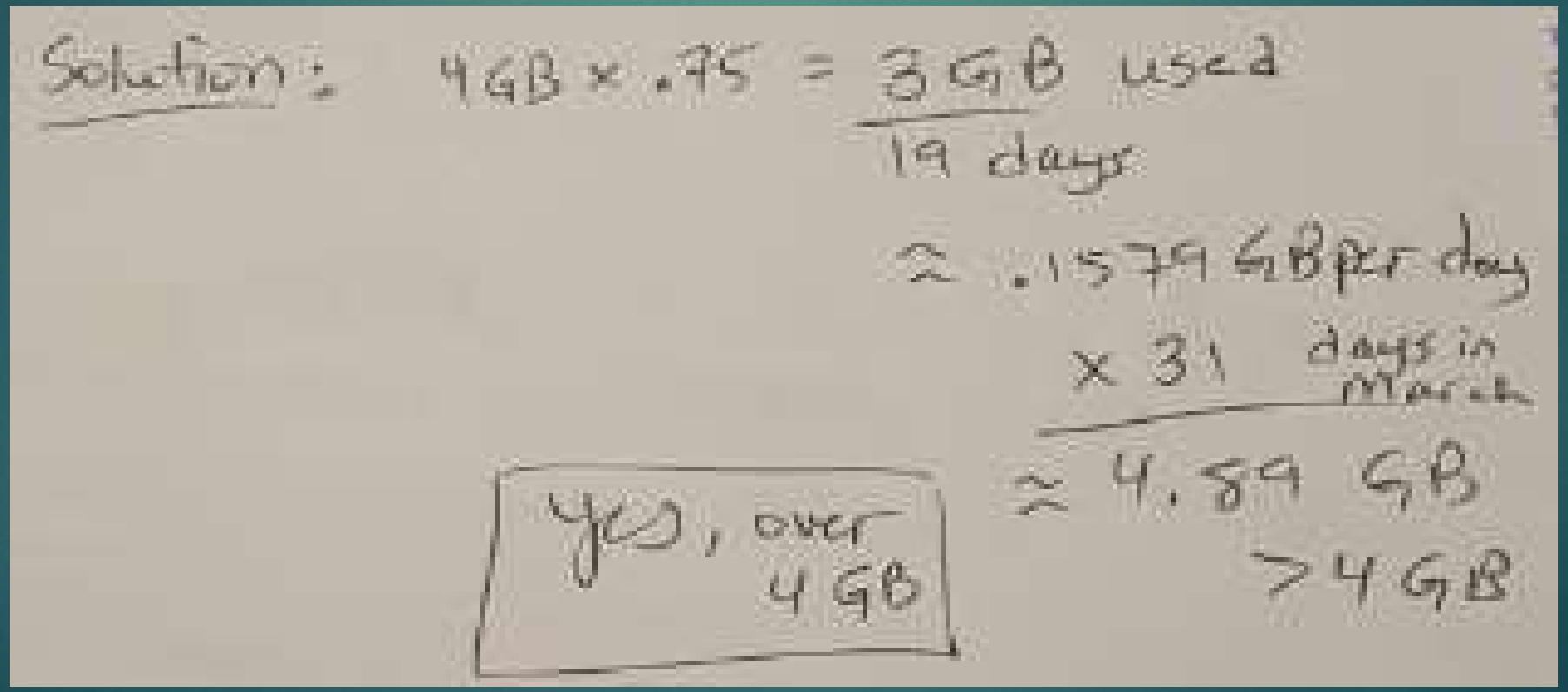
$714 + $804 = $1518 total for year

$1518 / 12

≈ [$126.50]/month

Example #2 – data usage

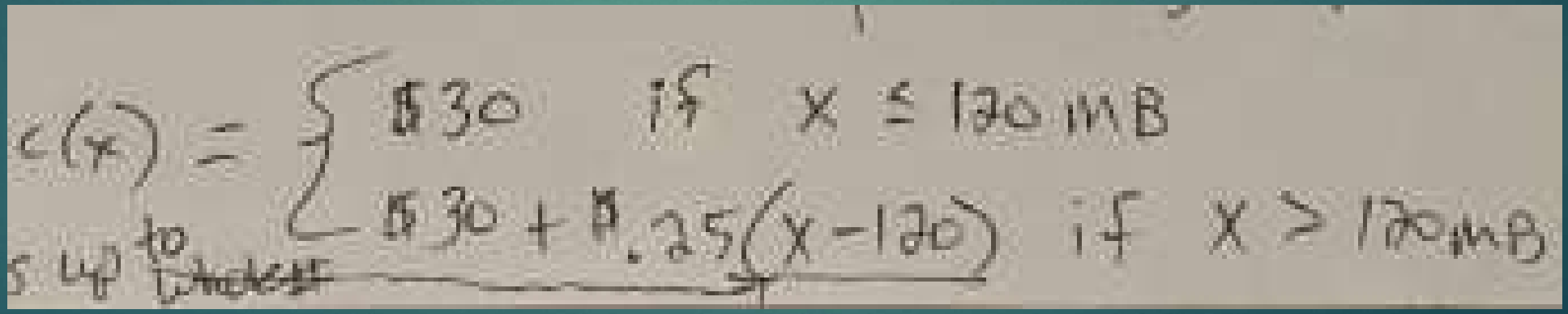
- Jake's cell phone plan includes 4GB of data usage. On the 19th day of his billing period he received a message from his service provider that he has already used 75% of his data allowance for the billing period. At this rate, will Jake use more than 4GB of data for the month?



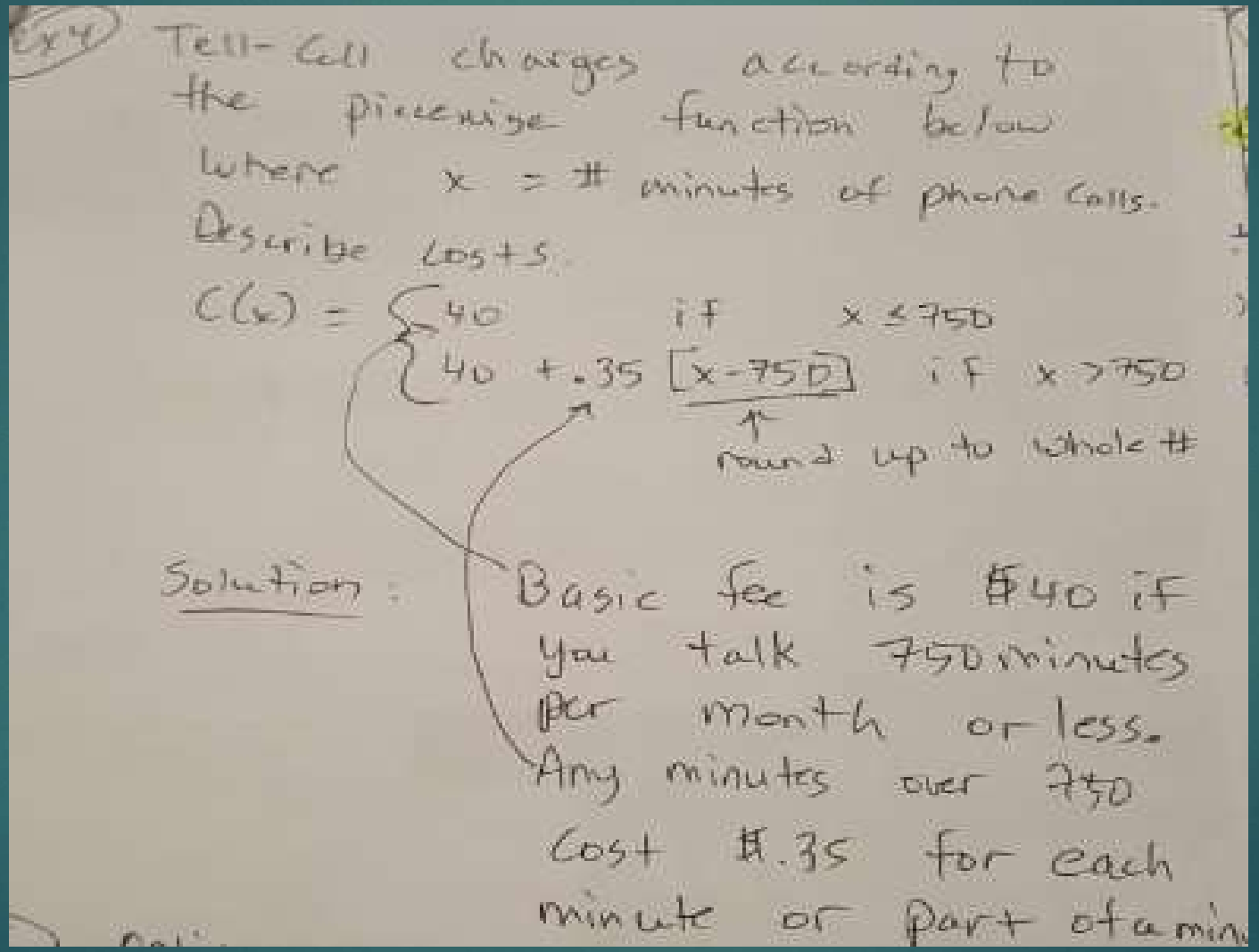
Example #3 – piecewise function

- Max is travelling abroad and has purchased a one-time use, 30-day international cell phone plan. There is a one-time fee of $30 and it includes 120 MB of data usage. Each extra megabyte, or part thereof, of data costs $0.25. Express the charge for this plan as a piecewise function.

- SOLUTION:



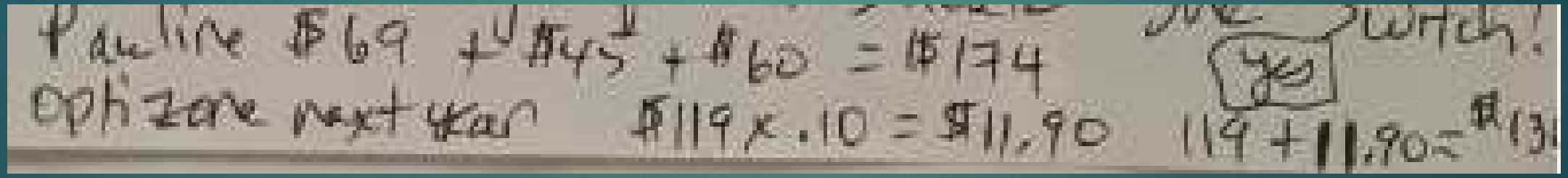
Example #4 – interpreting piecewise



Example #5 – pick a plan

- Optizone, a cable TV/Internet/phone provider, advertises a flat fee of $119 per month for all three services for new customers for the first year. The company estimates that this will increase 10% for the second year. Pauline normally pays $69 for her monthly home phone service, $45 for Internet service, and $60 for cable television. If Pauline's usage remains the same, how much will she save per month in the second year?

- SOLUTION:



- $130.90

Assignment: pg 674 #1 – 6 all, 9, start budget project spreadsheet, make intro. slide, auto expense slide, housing expense slide, and food budget slide for budget project

- 2)

Aaron's cell-phone plan includes 3GB of data. On the 21st day of his billing period, Aaron received a message from his service provider that he has already used 75% of his data allowance for the 31-day billing period. At this rate, will he use more than 3GB of data for the month? _____ ▾

- 3) Parisa's cell phone plan has a monthly fee of $95, which includes unlimited free text messages and phone calls and 5GB of data. Each extra gigabyte of data, or part thereof, costs $14.
  - a) Find the cost of a month in which Parisa used 6.2GB of data.
  - b) If x represents the number of gigabytes used, express the monthly charge c(x) of this plan as a piecewise function

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- 4)

A payphone at a shopping mall charges $0.68 for the first four minutes and $0.21 for each extra minute (or part of a minute).

a. Find the cost of a 10-minute call on this phone.

b. Find the cost of a 13.44-minute call on this phone.

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- 5) A phone company set the following rate schedule for an m-minute call from any of its pay phones.

$$c(m) = \begin{cases} 0.70 & \text{when } m \leq 6 \\ 0.70 + 0.24(m - 6) & \text{when } m > 6 \text{ and } m \text{ is an integer} \\ 0.70 + 0.24([m - 6] + 1) & \text{when } m > 6 \text{ and } m \text{ is not an integer} \end{cases}$$

a. What is the cost of a call that is under six minutes?

b. What is the cost of a 14-minute call?

c. What is the cost of a $9\frac{1}{2}$-minute call?

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- 6) The Tell-All Phone Company prepaid phone card has charges of $0.58 for the first 2 minutes and $0.21 for each extra minute (or part of a minute). Express their rate schedule as a piecewise function. Let m represent the number of minutes and let c(m) represent the cost of the call

- 9)

A local cable TV/Internet/phone provider charges new customers $99 for all three services, per month, for the first year under their "3 for 129" promotion. Joanne normally pays $74for her monthly home phone service, $59 for Internet service, and $69 for cable television.

a. What are her percent savings if she switches to the "3 for129" plan? Round to the nearest percent.

b. If, after the first year, the flat fee for all three services is $129, what are her percent savings?