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Date:	4/5/2023
Instructor:	Samuel Chukwuemeka
Project:	Power Bill: Residential Rates
Company:	Mississippi Power https://www.mississippipower.com/content/dam/mississippi-power/pdfs/residential/pricing-and-rates/standard-application-rates/2022/R-60.pdf
Objectives:	(1.) Calculate the summer single phase service power bill of the residents of the state of Mississippi within each range of specific power usage manually using Arithmetic method. This assumes thirty days in a month. (2.) Write a piecewise function of the residential rates. (3.) Recalculate the **same** power bill of the residents of Mississippi within each range of specific power usage algebraically using the Piecewise Function method.
Information:	**Monthly Rate For Service** Base charge per day for single phase service $1.23 Summer billing months June through September, inclusive Charge per kWh for first 650 kWh 5.393 ¢ Charge per next 350 kWh 8.098 ¢ Charge per kWh for kWh over 1000 kWh 8.345 ¢

Arithmetic Method:	**Number to be tested:** **0kWh** **500kWh** **800kWh** **1200kWh** Assume 30 days in a month. $1.23 × 30 = $36.90 5.393¢ × 0.01 = $0.05393 8.098¢ × 0.01 = $0.08098 8.345¢ × 0.01 = $0.08345 **0kWh** 36.9 + 0.05393(0) = $36.90 **500kWh** 36.9 + 0.05393(500) 36.9 + 26.965 = 63.865 $63.87 **800kWh** 36.9 + 0.05393(650) + 0.08098(150) 36.9 + 35.0545 + 12.147 = 84.1015 $84.10 **1200kWh** 36.9 + 0.05393(650) + 0.08098(350) + 0.08345(200) 36.9 + 35.0545 + 28.343 + 16.69 = 116.9875 $116.99
Piecewise Function:	C = Cost, P = kWh Base Monthly Charge = $36.90 **First Piece:** Cost Per kWh = $0.05393 C(P) = 0.05393P + 36.9

	Second Piece: The first piece maximum is 650 kWh. 0.05393(650) = 35.0545 35.0545 + 36.9 = 71.9545 Cost Per kWh = \$0.08098 C(P) = 71.9545 + 0.08098(P – 650) C(P) = 71.9545 + 0.08098P – 52.637 C(P) = 0.08098P + 19.3175 **Third Piece:** The maximum kWh for the second piece price multiplier is 350. 0.08098(350) = 28.343 Cost Per kWh = \$0.08345 C(P) = 71.9545 + 28.343 + 0.08345(P – 1000) C(P) = 100.2975 + 0.08345P – 83.45 C(P) = 0.08345P + 16.8475 $C(P) = \begin{cases} 0.05393P + 39.6; 0 \leq P \leq 650 \\ 0.08098P + 19.3175; 650 < P \leq 1000 \\ 0.08345P + 16.8475 < P \end{cases}$
Piecewise Function Method:	**Number to be tested:** **0kWh** **500kWh** **800kWh** **1200kWh** **0kWh** 0.05393(0) + 36.9 = \$36.90 **500kWh** 0.05393(500) + 36.9 26.965 + 36.9 = 63.865 \$63.87 **800kWh**

	0.08098(800) + 19.3175 64.784 + 19.3175 = 84.1015 $84.10 **1200kWh** 0.08345(1200) + 16.8475 100.14 + 16.8475 = 116.9875 $116.99
Citation:	APA style: *RESIDENTIAL ELECTRIC SERVICE RATE SCHEDULE "R-60" Mississippi Public Service Commission Schedule No. 1*. (2022). https://www.mississippipower.com/content/dam/mississippi-power/pdfs/residential/pricing-and-rates/standard-application-rates/2022/R-60.pdf *Piecewise Functions*. (n.d.). Piecewise-Functions.appspot.com. https://piecewise-functions.appspot.com/#studentProjectPowerBill