20. (2.5 points)

The following information is known about a balanced retrospectively rated policy:

Losses at minimum premium	$150,000
Losses at maximum premium	$400,000
Loss conversion factor	1.20
Basic premium	$50,000

- **There is a 10% chance that this policyholder has no losses.**
- **There is a 90% chance that the losses are uniformly distributed between $0 and $500,000.**
- **There are no taxes.**

Calculate the guaranteed cost premium for this policy.

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Question 20

Sample 1

Losses @ Min= $150,000
Losses @ Max= $400,000

E[Ground Up Loss] = 0.1 * 0 + 0.9 * 250,000 = 225,000

E[L] = Expected losses entering retro formula
= 0.1 * 150,000 + .9*[.3*150,000 + 0.2*400,000 + 0.5 * [(150,000 + 400,000)/2]
= 251,250

Expected Retro Premium = (b + c*E[L])T
= (50,000 + 1.2 * 251,250) = 351,500

Guaranteed cost premium = expected retro premium in a balanced plan.

Sample 2

E[A] = 0.9 * 250,000 = 225,000

Insurance Charge

Above Max =(500k – 400k)/2 * 0.2 * 0.9 = 9,000

Below Min =[(150k-0)/2 * 0.3 * 0.9] + 150k *0.1 = 35,250

Converted Insurance Charge = 1.2 * (9,000 – 35,250) = -31,500

b = e - (c-1)E + cI

e+E = (b + cE - cI)*T

= 50,000 + 1.2 * 225,000 – (-31,500)

= 351,500

The plan is balanced, so GCP = e+E = 351,500.