Equitable Equations: *Random variables*

Problem 1

Which of the following represent random variables? Briefly justify/explain.

(a) The speed of a randomly-selected car on the highway *Yes, random numeric*

(b) The amount of gas in a randomly-selected car's tank *Yes, random numeric*

(c) The height of the statue of liberty *No, not random*

(d) The average of fifty randomly-selected numbers, each between 0 and 1.

Problem 2

No, average isn't random → Yes, process is still random

A college's IT department determines that the number of internet-connected devices carried by a randomly-selected student at the college has the following distribution.

X	0	1	2	3	4
P(X)	0.4%	17.2%	52.2%	24.7%	??

(a) Fill in the missing value. Assume that no student has more than 4 internet-connected devices.

$$P(x) = 1 - P'(x)$$
$$= 5.5\%$$

(b) What is the probability that a random-selected student has no more than 2 devices?

$$P(x) = .4 + 17.2 + 52.2$$
$$= 69.8\%$$

(c) What is the probability that a random-selected student has more than 2 devices?

$$P(E) = 24.7 + 5.5$$
$$= 30.2\%$$

Problem 3

A random-number generator prints out integers from 1 to 5 with probabilities given by the following histogram.
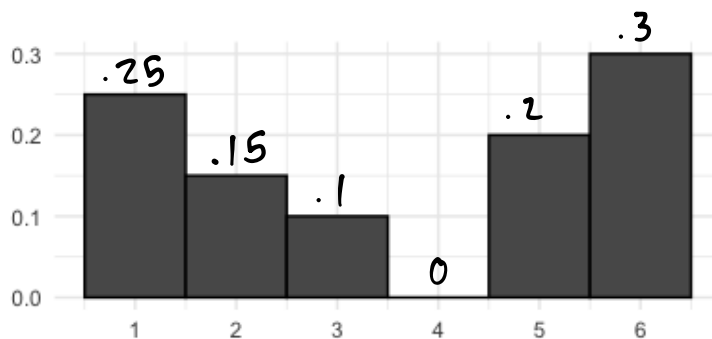
(a) What is the probability that the next number generated is 2? *15%*

(b) What is the probability that the next number generated is 1 or 5? *.25 + .3 = 55%*

(c) If 80 numbers are generated, about how many 2's would you expect? Briefly explain your reasoning.

15% of 80 = 12   so ~12 numbers would be 2

because the probability of getting a 2 is 15%