Intro to Stats: Homework 5.1-2, Day 1

You may do your work and show your answers right on this page.

1. Suppose we have an experiment where we toss five quarters. Our random variable X counts the total number of heads that show up on the five quarters. What values can X have? (Answer alone is sufficient.)

2. This time we have an experiment where we toss a quarter and a dime. Our random variable X counts the total number of cents on the coins that end as heads up. Assuming both coins are fair, identify the values X can have and construct the pdf for X. Fill in the chart to the right.

x	P(x)

3. A researcher reports that when groups of four children are randomly selected from a population of couples meeting certain criteria, the supposed pdf for the number of girls is shown to the right.
Is this a legitimate pdf? If no, identify what characteristic fails.

x	P(x)
0	0.502
1	0.365
2	0.098
3	0.011
4	0.001

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4. Three males with an X-linked genetic disorder have one child each. The random variable Y is the number of children among the three who inherit the X-linked genetic disorder. The supposed pdf for Y is shown to the right.
Is this a legitimate pdf? If no, identify what characteristic fails. (Note: I used Y instead of X, since X was being used for something else in this problem.)

y	P(y)
0	0.4219
1	0.4219
2	0.1406
3	0.0156

5. The random variable X has the pdf shown to the right. Find the following probabilities:

x	P(x)
1	0.05
2	0.10
3	0.16
4	0.22
5	0.17
6	0.15
7	0.05
8	0.05
9	0.03
10	0.02

a) $P(X = 5)$

b) $P(X \leq 3)$

c) $P(X > 8)$

d) $P(X \leq 8)$

e) $P(X = 2 \text{ or } X = 3)$

f) $P(X = 2 \text{ and } X = 3)$