

# Engineering Probability and Statistics

## Homework 3

23/10/2016

Q1) A shipment of 20 similar laptop computers to a retail outlet contains 3 that are defective. If a school makes a random purchase of 2 of these computers, find the probability distribution for the number of defectives.

Q2) (A) Find the cumulative distribution function (CDF) of the random variable X if the probability distribution of is given as:  $f(0) = 1/16$ ,  $f(1) = 1/4$ ,  $f(2) = 3/8$ ,  $f(3) = 1/4$ , and  $f(4) = 1/16$ .

(B) Draw CFD

Q3) Classify the following random variables as discrete or continuous:

X: the number of automobile accidents per year in Virginia.

Y : the length of time to play 18 holes of golf.

M: the amount of milk produced yearly by a particular cow.

N: the number of eggs laid each month by a hen.

P: the number of building permits issued each month in a certain city.

Q: the weight of grain produced per acre.

Q4) Let  $W$  be a random variable giving the number of heads minus the number of tails in three tosses of a coin.

- (A) List the elements of the sample space  $S$  for the three tosses of the coin and to each sample point assign a value  $w$  of  $W$ .
- (B) Find the probability distribution of the random variable  $W$  in Exercise 3.3, assuming that the coin is biased so that a head is twice as likely to occur as a tail (Hint:  $P(H) = 2/3$  and  $P(T) = 1/3$ ).