

## Extra Problems

1. A fair coin is tossed 8 times and let  $x$  be the number of heads. The probability distribution is below. Keep all decimals for exact answers.

$x$	$P(x)$
0	0.00390625
1	P(1)
2	P(2)
3	P(3)
4	P(4)
5	P(5)
6	P(6)
7	P(7)
8	0.00390625

- Find  $P(1)$ ,  $P(2)$ ,  $P(3)$ ,  $P(4)$ ,  $P(5)$ ,  $P(6)$ , and  $P(7)$ .
- Find the mean using  $\mu = \sum(x \cdot P(x))$ .
- Find the standard deviation using  $\sigma = \sqrt{\sum(x^2 P(x)) - \mu^2}$ .
- Find the mean using  $\mu = np$ .
- Find the standard deviation using  $\sigma = \sqrt{npq}$ .
- Find the probability of getting at least 2 heads.

2. A die is tossed 120 times and let  $x$  be the number of getting 2's.

- Use normal approximation to binomials; find the probability of getting between thirty seven 2's and forty five 2's **without continuity corrections**
- Use normal approximation to binomials; find the probability of getting **at least** forty seven 2's **with continuity corrections**
- Use normal approximation to binomials; find the probability of getting **at most** forty two 2's **with continuity corrections**

3. Assume that statistics third exam scores that are *normally distributed* with a mean **75** and a standard deviation of **4.8**

- Find the probability that a randomly selected student has a score greater than 72.
- Find the probability that a randomly selected student has a score between 70 and 80.
- Find the statistics score separating the bottom 99.5% from the top 0.5%.
- Find the statistics score separating the top 64.8% from the others.