

Assignment #6

4.46a

The sample space for this experiment is $S = \{SSSSS, SSSF, FSSSS, FSSSF, SFSSS, SFSSF, SSFSS, SSFSF, SSSFS, SSSFF, FFSSS, FFSSF, FSFSS, FSFSF, FSSFS, FSSFF, SFFSS, SFFSF, SFSFS, SFSFF, SSFFS, SSFFF, SFFES, SFFFF, FSFFS, FSFFF, FFSFS, FFSFF, FFFSS, FFFSF, FFFFS, FFFFF\}$. Note there are 36 sample points; each equally likely to occur. Hence for each outcome $o \in S$, $p(o) = 1/32 \approx 0.03125$.

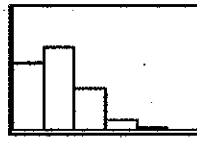
Event	x	p(x)	$\approx p(x)$
SSSSS	5	1/32	0.03125
FSSSS, SFSSS, SSFSS, SSSFS, SSSFF	4	5/32	0.15625
FFSSS, FSFSS, FSSFS, SFFSS, SFSFS, SSFFS, FSSSF, SFSSF, SSFSF, SSSFF	3	10/32	0.3125
SSFFF, SFSFF, SFFSF, FSSFF, FSFSF, FFSSF, SFFFF, FSFFS, FFSFS, FFFSS	2	10/32	0.3125
SFFFF, FSFFF, FFSFF, FFFSF, FFFFS	1	5/32	0.15625
FFFFF	0	1/32	0.03125

4.50

a. binompdf(5,0.5)



b. binompdf(5,0.2)



c. binompdf(5,0.8)



d. The graphs of the three distributions are shown above.

e. A binomial distribution will be symmetric if $p = 0.5$, skewed to the right if $p < 0.5$, and skewed to the left if $p > 0.5$.

4.52

a. This experiment is approximately binomial because each outcome is either “yes” or “no” indicating whether or not tap water is used. Also, the trials are independent and the probabilities remain the same for each trial.

$$b. p(x) = \binom{5}{x} (0.25)^x (0.75)^{5-x}$$

$$c. P(x = 2) = 0.264$$

$$d. P(x \leq 1) = 0.633$$

4.62 The probability that a family of 24 children will have 21 boys (or more) is about 0.0001. So, it appears that in the Rodgers family the men do produce boys. (Probability was calculated using a TI-84.)