**#4.21**

**a. 2x2x3 = 8 (each is 1/8)**

**HHH**

**HHT**

**HTH**

**HTT**

**THH**

**THT**

**TTH**

**TTT**

**b. Each is 1/8**

**c.**

**P(0) = 1/8 (TTT)**

**P(1) = 3/8 (HTT, THT, TTH)**

**P(2) = 3/8 (HHT,HTH,THH)**

**P(3) = 1/8 (HHH)**

**d. P(2) or P(3) = 3/8 + 1/8 = 4/8 = 1/2**

**#4.43**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number of Homes, X | P(X) | E(X) | (x-u) **2** p(x) |  |
| 0 | 0.09 | 0.00 | 0.292 |  |
| 1 | 0.30 | 0.30 | 0.192 |  |
| 2 | 0.37 | 0.74 | 0.015 |  |
| 3 | 0.20 | 0.60 | 0.288 |  |
| 4 | 0.04 | 0.16 | 0.194 | Std dev |
|  | 1 | 1.80 | 0.980 | 0.9899 |

1. **E(X) = 1.8**
2. **0.9899**
3. **1.80 – 2 \* 0.9899 = -0.1799**

**1.80 + 2 \* 0.9899 = 3.7799**

**P(0) + P(1) + P(2) + P(3) = 0.09 + 0.3 + 0.37 + 0.2 = 0.96**

**#4.46**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Gain X |  | Probability  P(x) | E(X) | (x-u) **2** p(x) |  |
| 7000000 | Winning | 4.34783E-08 | 0.3043 | 2130435.206 |  |
| -1 | Not winning | 0.999999957 | -1.0000 | 0.093 | Std dev |
|  |  |  | -0.6957 | 2130435.2987 | 1459.6011 |

**E(x) = -$.70**

**On average, the expected lotto winning is -$.70. The is very little change you will win the money.**

**#4.128**

**P(spanking) = 0.6**

**P(no spanking) = 0.4**

**p=.6 q=.4 n=3**

|  |  |
| --- | --- |
| **p(0)** | **0.064** |
| **p(1)** | **0.288** |
| **p(2)** | **0.432** |
| **p(3)** | **0.216** |

1. **p(0) = 0.064**

**p(0) = (3,0) .60 .43-0 = 1 \* 1 \* .064 = .064**

**(3,0) = 3! / 0! (3-0)! = 1**

1. **p(1) + p(2) + p(3) = 1 – p(0) = 0.936**
2. **mean = .6 \* 3 = 1.8 std dev = sqr(.6\*.4\*3) = 0.8485**
3. **The distribution is left skewed. At least 75% will fall between 1.8 - 0.8485 = 0.9515 and 1.8 + 0.8485 = 2.6485. The probability of p(0) + p(1) + p(2) = .0784**

**# 4.137**

p(no pesticide) = .65

p(pesticide) = .35

n = 800

1. Mean = .65 \* 800 = 520 dev = sqrt(.65\*.35\*800) = 13.4907
2. No. p(x < 400) = 0 The z value is less than -3.

z = 400 – 520 / 13.49 =-120/13.49 = -8.89