Exam #1 — Fall 2020

1. (a) 40,320
   (b) 120,960
2. 0.7
3. (a)

X, Z	0	1	2	3
0	0.512	0.128	0	0
1	0	0.256	0.064	0
2	0	0	0.032	0.008

   (b) $\frac{2}{3}$
   (c) $\frac{2}{3}$
   (d) 0.960
   (e) Probability that at most 1 of first 2 patients and at most 2 of first 3 patients already had their flu shot.
   (f) No. Why???
4. (a) \$110,000
   (b) 4,425,000 ($\$^2$)
5. (a) Number of trials until $\left(\sum_{i=1}^{m} r_i\right)^{th}$ success.
   (b) $X \sim$ Neg Bin$(r = \sum_{i=1}^{m} r_i, p)$
   (c) $\frac{\sum_{i=1}^{m} r_i}{p}$
   (d) $\frac{q\sum_{i=1}^{m} r_i}{p^2}$
6. 0.8441

Exam #1 — Fall 2019

1. (a) for n = 5: 0.007936508; for n=7: 0.0005827506
   (b) for n = 5: 0.03968254; for n=7: 0.004079254
2. 0.4992474
3. (a) 9
   (b) 0.1241174
   (c) 0.5518765
4. (a) 0.512
   (b)
   (c)
   (d)
   (e)
   (f)
   (g)
5. (a) \$ 294,000
   (b) 144,000 ($\$^2$)

Exam #1 — Fall 2018

1. (a) 0.5923077
   (b) 0.9984615
2. 0.9439963
3. (a) 0.07992008
   (b) 0.004872
   (c) 0.995128
   (d)
4. (b) Make sure $F(3,3) = 1$.
   (f) 2.444444
   (g) 0.4691358
5. (a) 6,600
   (b) 3,630

Exam #1 — Fall 2017

1. (a) 24
   (b) 12
   (c) 6.042685e+29
   (d) 7.13288e+20
   (e) 1.78322e+20
2. (a) $1 - \left(\frac{35}{36}\right)^n$
   (b) 24.6051, rounding up $n = 25$
3. (a) 0.4999997
4. (a) $\sum_{x=7}^{\infty} \frac{e^{-10}10^x}{x!}$
   (b) 0.114457
   (c) $\frac{e^{-5}5^x}{x!} \cdot \binom{x}{2}(.04)^2(.96)^{x-2}$
5. (a) 0.1138612
   (b) -2.222222
   (c) 234.5679
6. (a) $a^2\text{Var}(X)$
   (b) Proof

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1. (a) 40,320
   (b) 120,960
2. (a) $\sum_{x=11}^{21} \frac{\binom{100}{x}\binom{600}{21-x}}{\binom{700}{21}}$
   (b) $\sum_{x=11}^{21} \binom{21}{x}\left(\frac{1}{7}\right)^{x}\left(\frac{6}{7}\right)^{21-x}$
3. 0.3916084
4. (a) $p_X(x) = \left(\frac{2}{3}\right)^{x-1} \cdot \frac{1}{3}$ for $x = 1, 2, 3, 4$ and $p_X(x) = \left(\frac{2}{3}\right)^{4}$ for $x = 5$
   (b) $p_Y(y) = \frac{5}{9}$ for $y = 1$ and $p_Y(y) = \frac{4}{9}$ for $y = 0$
   (c) 0
   (d) 0.44444
   (e) 0.4
   (f) 0
5. (a) \$7500
   (b) $\$^2$ $525,000$
6. proof