

❁ THE TWELVE DAYS OF CHRISTMAS ❁



On the first day of Christmas, my true love gave to me: A Partridge in a Pear Tree.

If the probability of getting a partridge is 0.58 and the probability of getting a pear tree is 0.76, and these are independent events, find the probability of getting a partridge and a pear tree.





On the second day of Christmas, my true love gave to me: Two Turtle Doves.

If the probability of a female turtle dove is 0.53, find the probability of at least one female turtle dove in the pair.





On the third day of Christmas, my true love gave to me: Three French Hens.

If the probability of a hen truly having French citizenship is 0.81, find the probability of exactly two French hens out of the three.





On the fourth day of Christmas, my true love gave to me: Four Calling Birds.

If there is an infinite number of calling birds and the probability of a bird actually calling is 0.63, find the probability of finding the first calling bird on the third attempt.





On the fifth day of Christmas, my true love gave to me: Five Golden Rings.

If the probability of getting a real golden ring is 0.72, find the probability of getting three or fewer golden rings in the five.





On the sixth day of Christmas, my true love gave to me: Six Geese A-laying.

If the probability of an authentic laying goose is 0.83 and there is an unlimited number of geese, find the probability of getting a laying goose on or before the fourth trial.







On the seventh day of Christmas, my true love gave to me: Seven Swans A-swimming.

If the probability of a swan drowning is 0.23, find the probability of exactly 4 out of the 7 swans drowning.





On the eighth day of Christmas, my true love gave to me: Eight Maids A-milking.

If the probability of getting a sour maid a-milking is 0.38, find the expected number of sour maids a-milking in the group of 8.





On the ninth day of Christmas, my true love gave to me: Nine Ladies Dancing.

If the probability of a dancing lady accepting an invitation to dance is 0.18, find the expected number of ladies you would have to ask before one accepts.





On the tenth day of Christmas, my true love gave to me: Ten Lords A-leaping.

If the probability of a lame leaping lord is 0.24 and there is an unlimited number of leaping lords, find the probability of getting your first lame leaping lord after the sixth attempt.





On the eleventh day of Christmas, my true love gave to me: Eleven Pipers Piping.

If the probability of frozen pipes is 0.63, find the probability of 8 or more frozen pipes out of the eleven.





On the twelfth day of Christmas, my true love gave to me: Twelve Drummers Drumming.

If the probability of a dribbling drummer is 0.48, find the standard deviation of the dribbling drummers drumming for twelve drummers drumming.





If you round all answers to three significant digits, the sum of the twelve answers should be 14.0479.

THE TWELVE DAYS OF STATISTICS



On the first day of Statistics, my true love gave to me: A Partridge in a Pear Tree.

If the probability of getting a partridge is 0.58 and the probability of getting a pear tree is 0.76, and these are independent events, find the probability of getting a partridge and a pear tree.





On the second day of Statistics, my true love gave to me: Two Turtle Doves.

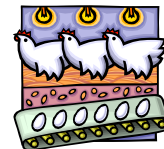
If the probability of a female turtle dove is 0.53, find the probability of at least one female turtle dove in the pair.





On the third day of Statistics, my true love gave to me: Three French Hens.

If the probability of a hen truly having French citizenship is 0.81, find the probability of exactly two French hens out of the three.





On the fourth day of Statistics, my true love gave to me: Four Calling Birds.

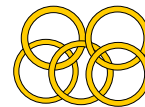
If there is an infinite number of calling birds and the probability of a bird actually calling is 0.63, find the probability of finding the first calling bird on the third attempt.





On the fifth day of Statistics, my true love gave to me: Five Golden Rings.

If the probability of getting a real golden ring is 0.72, find the probability of getting three or fewer golden rings in the five.





On the sixth day of Statistics, my true love gave to me: Six Geese A-laying.

If the probability of an authentic laying goose is 0.83 and there is an unlimited number of geese, find the probability of getting a laying goose on or before the fourth trial.







On the seventh day of Statistics, my true love gave to me: Seven Swans A-swimming.



If the probability of a swan drowning is 0.23, find the probability of exactly 4 out of the 7 swans drowning.



On the eighth day of Statistics, my true love gave to me: Eight Maids A-milking.

If the probability of getting a sour maid a-milking is 0.38, find the expected number of sour maids a-milking in the group of 8.





On the ninth day of Statistics, my true love gave to me: Nine Ladies Dancing.

If the probability of a dancing lady accepting an invitation to dance is 0.18, find the expected number of ladies you would have to ask before one accepts.





On the tenth day of Statistics, my true love gave to me: Ten Lords A-leaping.

If the probability of a lame leaping lord is 0.24 and there is an unlimited number of leaping lords, find the probability of getting your first lame leaping lord after the sixth attempt.





On the eleventh day of Statistics, my true love gave to me: Eleven Pipers Piping.

If the probability of frozen pipes is 0.63, find the probability of 8 or more frozen pipes out of the eleven.





On the twelfth day of Statistics, my true love gave to me: Twelve Drummers Drumming.

If the probability of a dribbling drummer is 0.48, find the standard deviation of the dribbling drummers drumming for twelve drummers drumming.





If you round all answers to three significant digits, the sum of the twelve answers should be 14.0479.

I have students write answers to three significant digits

1. $0.58 \times 0.76 = 0.441$
2. $P(X \geq 1) = 1 - P(X = 0) = 1 - 0.47^2 = 0.779$
3. $P(X = 2) = \text{binompdf}(3, 0.81, 2) = 0.374$
4. $P(X = 3) = \text{geompdf}(0.63, 3) = 0.0862$
5. $P(X \leq 3) = \text{binomcdf}(5, 0.72, 3) = 0.430$
6. $P(x \leq 4) = \text{geomcdf}(0.83, 4) = 0.999$
7. $P(X = 4) = \text{binompdf}(7, 0.23, 4) = 0.0447$
8. $\mu = np = 8(0.38) = 3.04$
9. $\mu = 1/p = 1/0.18 = 5.56$
10. $P(X > 6) = 1 - \text{geomcdf}(0.24, 6) = 0.193$
11. $P(x \geq 8) = 1 - \text{binomcdf}(11, 0.63, 7) = 0.371$
12. $\sigma = \sqrt{np(1-p)} = \sqrt{12(0.48)(0.52)} = 1.73$

This worksheet was originally created by Jim Luhring.