

# ❁ 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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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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.



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*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.

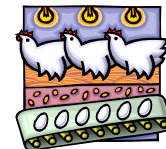


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*On the third day of Statistics, my true love gave to me: Three French Hens.*

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.



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*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.

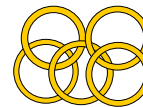


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*On the fifth day of Statistics, my true love gave to me: Five Golden Rings.*

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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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*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.



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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.  $P(x \leq 4) = \text{geometcdf}(0.83, 4) = 0.999$
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.  $P(X > 6) = 1 - \text{geometcdf}(0.24, 6) = 0.193$
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.