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1) Since the runtime of the function is dependent on the input, the time complexity will be O(n).

2) def factorial(n):

    if (n == 0):

        return

    return n * factorial(n - 1)

3) Sine the runtime of the function is dependent on the half of the input, where the inner loop will run for every outer loop, then the time complexity will be O(n^2)

4) $\begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} e \\ f \end{bmatrix} = \begin{bmatrix} a(e) + b(f) \\ c(e) + d(f) \end{bmatrix}$

5a) f'(x) = 6x + 5

5b) f'(5) = 6(5) + 5 = 35

5c) f''(x) = 6

5d) f''(5) = 6

6a) fx = 6xy + 5

6b) fx(5, 2) = 6(5)(2) + 5 = 65

7) P(A and B) = P(A) * P(B) = 0.18

    P(A or B) = P(A) + P(B) - P(A and B) = 0.72

    P(not(A)) = 1 – P(A) = 0.7

    P(A|B) = P(A) = 0.3

8a) P(price < $75) = 255/400 = .6375

8b) P(price < $75 | color=green) = P(price < $75 and color=green) / P(color=green) = .1625 / .2375 = 0.6842

8c) P(price < $75, color=green) = P(price < $75) * P(price < $75 | color=green) = .6375 * .6842 = 0.4362

9) 1 egg per day / 2 hens = 0.5 eggs per hen per day * 10 days = 5 eggs * 10 hens = 50 eggs

12a) C

12b) C

13) C