

1) What is the $O()$ of the polynomial $\sum_{i=1}^n i$?

$$\sum_{i=1}^n i = \frac{n(n+1)}{2} \Rightarrow \boxed{O(N^2)} \quad 1.$$

2) Tree has 9 Edges. Find total degree & # of vertices.

$$\text{Total degree} = 9 \cdot 2 = 18$$

$$\# \text{ of vertices} = 9 + 1 = 10$$

2.

3) $P(A) = .2$, $P(B) = .3$, A & B are independent

$$P(A \cap B) = P(A) \cdot P(B) = \frac{2}{10} \cdot \frac{3}{10} = \frac{6}{100} = 6\%$$

$$P(A \cup B) = P(A) + P(B) = 0.5$$

3.

4) Expected value = $\sum_{i=1}^n a_i x_i$

$$= \frac{3}{35} (1 + 6) + \frac{6}{35} (0 + 2 + 3 + 4 + 5)$$

$$= \frac{3 \cdot 7}{35} + \frac{3 \cdot 2 \cdot 14}{35} = \frac{3}{35} (35) = \boxed{3} \quad 4.$$

5) $(u^2 - v^2)^{10}$. find coefficient of $u^4 v^6 \Rightarrow n=10$ & $r=7$ or 3

$$\left. \begin{aligned} \binom{10}{3} &= \frac{10!}{3!(10-3)!} = \frac{10!}{7!3!} \\ \binom{10}{7} &= \frac{10!}{7!(10-7)!} = \frac{10!}{7!3!} \end{aligned} \right\} = \frac{10 \cdot 9 \cdot 8}{3 \cdot 2 \cdot 1} = \boxed{120} \quad 5.$$