

Special Mathematics

2ND TEST-A

Problem 1. *Flip a fair coin 10 times. Let X equal the number of heads in the first 6 flips. Let Y equal the number of heads in the remaining 4 flips. Find $P_X(x)$ and $P_Y(y)$. Find $X + Y$, $P_{X,Y}(x, y)$ and $P(X \leq Y)$.*

4.5 points

Problem 2. i) *Find a general solution of the differential equation*

$$y^4(x) + \frac{2}{x} (y(x) - 3y'(x)) = 0$$

ii) *Find a homogeneous linear differential equation with constants coefficients whose general solution is*

$$y(x) = c_1 \cdot \cos 3x + c_2 \cdot \sin 3x$$

4.5 points