VATSAV SETHUPATHI

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DATA 363 Checkpoint C1C2

C1-4 ① Probability that the sum of 3 dice is less than 7

② Probability that we get less than 3 tails

C1-10 $F_X(x) = P\{X \leq x\} = \begin{cases} 0 & x \leq 0 \\ x^2 & 0 < x \leq 1 \\ 1 & x > 1 \end{cases}$

① $F_X(1/2) = (1/2)^2 = \boxed{1/4}$

② $F_X(2/3) - F_X(1/2) = (2/3)^2 - (1/2)^2 = 4/9 - 1/4$

$= \boxed{7/36}$

③ For $P\{X \leq x_{1/2}\} = 1/2$

$x^2 = 1/2 \Rightarrow \boxed{x = 1/\sqrt{2}}$

Therefore, the median $x_{1/2} = 1/\sqrt{2}$

C2-6 • We can see that for consecutive values of x, $F_X(x) - F_X(x-1) = f_X(x)$

Let's take $x = 3$. $F_X(3) - F_X(2) = 0.5781 - 0.4375$

$= 0.1406$

$f_X(3) = 0.1406$ ✓

• ① $P\{X \leq 4\} = F_X(4) = 0.68359$

② $P\{2 < X \leq 5\} = F_X(5) - F_X(2) = 0.762 - 0.4375$

$= 0.3252$

③ $P\{X > 5\} = 1 - P\{X \leq 4\} = 1 - 0.68359$

$= \boxed{0.31641}$