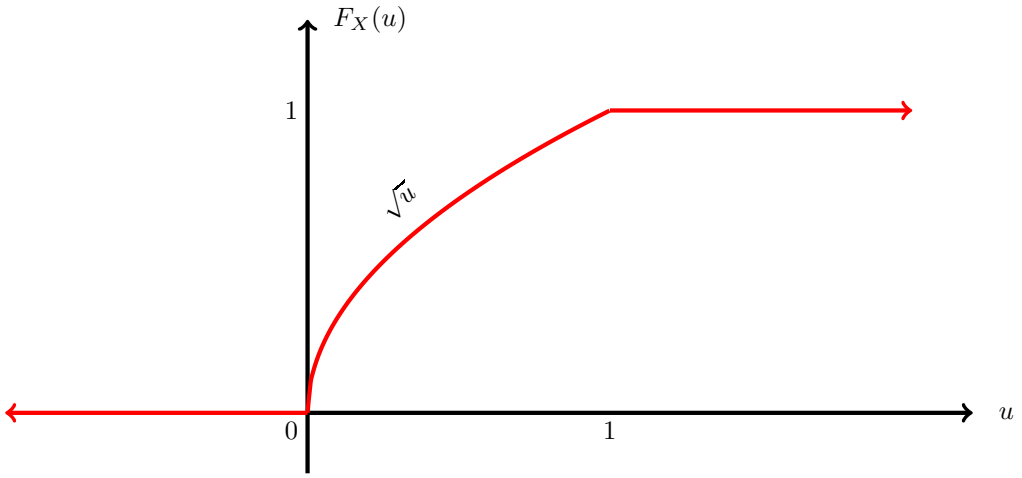
Let X be a random variable, whose cummulative distribution function equals $\sqrt{u}$ in the interval $[0, 1]$, as shown below. What is the probability that $X + 2$ lies in the interval $[0, 2.25]$, and $81X^2$ is greater than 1 ?



(a) 1/6

(b) 1/3

(c) 2/3

(d) 1/2

(e) 1/4

(f) 1/9

(g) 5/9

(h) 5/36

(i) 3/4

(j) 0

(k) 1

(l) None of these

Solution:

$$\begin{aligned} P(X+2 \in [0, 2.25],\ 81X^2 > 1) &= P(1/9 < X < 1/4) \\ &= F_X(1/4) - F_X(1/9) \\ &= \sqrt{1/4} - \sqrt{1/9} \\ &= 1/2 - 1/3 \\ &= 1/6. \end{aligned}$$