① $\int_{2}^{3} f_X(x)\,dx = 1$

$f_X(x) = \frac{1}{5}$

$Y = X^2$

$Y \in [0, 9]$

$y = x^2$

$\int_{-2}^{x} \frac{1}{5}\,dx$

$\frac{x+2}{5}$

~~$F_Y(y)$~~

$F_Y(y) =$

$$F_X(x) = \begin{cases} 0 & x < -2 \\ \frac{x+2}{5} & -2 < x < 3 \\ 1 & x > 3 \end{cases}$$

$Y = X^2$ $\quad x \in (-2, 3)$

$y \in (0, 9)$

$y \in (0, 9)$

$F_Y(y) = P(Y \le y)$

$= P(X^2 \le y)$

$= P(-\sqrt{y} \le X \le \sqrt{y})$

$y \in (0, 9)$ $\quad = P(x \le \sqrt{y}) - P(x \le -\sqrt{y})$

$= F_X(\sqrt{y}) - F_X(-\sqrt{y})$

$f_Y(y) = P(Y \le y)$ $\quad Y \in (0, 9)$

$(-2, 2)$