1) Take x from $f(x) = \sqrt{\frac{2}{\pi}} e^{-\frac{x^2}{2}}, x>0$

2) Define $Y = -X$ ~~if $x>0$~~ w.p. $\frac{1}{2}$ $\hookrightarrow$ Folded normal distribution

$= X$ ~~if $x<0$~~ w.p. $\frac{1}{2}$

Then $Y \sim N(0,1)$

To draw obs. from f.

Take the proposed as $g(x) = e^{-x}, x>0$.

Then $c = \sup_{x>0} \frac{f}{g} = \sqrt{\frac{2e}{\pi}}$

$\rightarrow Z \sim Bin(1, \frac{1}{2})$, ~~$Y \overset{d}{=} X Z + X(1-Z)$~~

$Y \overset{d}{=} -XZ + X(1-Z)$

3. $P(X=x)$: 1/3 1/3 1/9 1/9 1/9

x : 1 2 3 5 7 $\rightarrow$ target

$P(X^* = x) = \frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\rightarrow$ proposed

$c = \sup_x \left\{ \frac{f}{g} \right\} = \sup_x \left\{ \frac{5}{3}, \frac{5}{9}, \frac{5}{9}, \frac{5}{9}, \frac{5}{3} \right\} = \frac{5}{3}$

4. $f(x) = \text{Gamma}(\alpha, p), p>1$

$e^{-\alpha x} x^{p-1} \frac{\alpha^p}{\Gamma p}, x>0$

For integer p, $X_i \overset{iid}{\sim} Exp\left(\text{mean} = \frac{1}{\alpha}\right), i = 1(1)p$

$\Rightarrow \sum_{i=1}^{n} X_i \sim G(\alpha, p)$

Take $g(x) = G\left(\frac{\alpha}{2}, [p]\right)$

$c = \sup_x \frac{f(x)}{} = \sup \left\{ e^{-\alpha x} x^{p-1} \frac{\alpha^p}{} \right.$