10. $f(x) = x^3 e^{-x}$

① DOMAIN

$f(x) = \frac{x^3}{e^x}$

$e^x = 0$

$\ln e^x = \ln 0$

$(-\infty, \infty)$

② X-INT

$0 = x^3 e^{-x}$

$x^3 = 0$ $\quad e^{-x} = 0$

$x = 0$

③ Y-INT

$y = 0^3 e^{-0}$

$y = 0 \; (1)$

$y = 0$

④ V.A.

NONE

⑤ H.A.

$\lim_{x \to \infty} x^3 e^{-x}$

$= \lim_{x \to \infty} \frac{x^3}{e^x}$

L'Hôpital's RULE

$= \lim_{x \to \infty} \frac{3x^2}{e^x}$

$= \lim_{x \to \infty} \frac{6x}{e^x}$

$= \lim_{x \to \infty} \frac{6}{e^x}$

$= \frac{6}{e^\infty}$

$= \frac{6}{\infty}$

$= 0$

H.A. $y = 0$

⑥ S.A.

NONE