(*) $y(n) = Ax(n) + B$

Here, $y_1(n) = Ax_1(n) + B$

$y_2(n) = Ax_2(n) + B$

$\therefore y_3(n) = a_1[Ax_1(n) + B] + a_2[Ax_2(n) + B]$ —— (I)

Again, $x_3(n) = a_1 x_1(n) + a_2 x_2(n)$

$\therefore y(n) = Ax_3(n) + B$

$= A[a_1 x_1(n) + a_2 x_2(n)] + B$ —— (II)

Here, eq^n (I) $\neq$ eq^n (II).

As the system does not follow superposition theorem

it is non-linear system.

(*) $y(n) = e^{x(n)}$

Here, $y_1(n) = e^{x_1(n)}$

$y_2(n) = e^{x_2(n)}$

$\therefore y_3(n) = a_1 e^{x_1(n)} + a_2 e^{x_2(n)}$ —— (I)

Again, $x_3(n) = a_1 x_1(n) + a_2 x_2(n)$

$\therefore y(n) = e^{x_3(n)}$

$= e^{[a_1 x_1(n) + a_2 x_2(n)]}$ —— (II)

Here, eq^n (I) $\neq$ eq^n (II).

The system is non-linear.