HW 1 Solution

Answers to 1.1, 1.3, 1.10 vary depending on your choice of systems.

1.10 Linearity of $a \sin x$ _____

From the first definition of linearity $f(\alpha x) = \alpha f(x)$

For this function to be linear, the following must hold. $a \sin(\alpha x) \neq \alpha(a \sin(x))$
As can be seen the two sides are not equal.

From the second definition of linearity $f(x_1 + x_2) = f(x_1) + f(x_2)$

To be linear, the following must hold. $a \sin(x_1 + x_2) \neq (a \sin x_1) + (a \sin x_2)$
As can be seen the two sides are not equal.