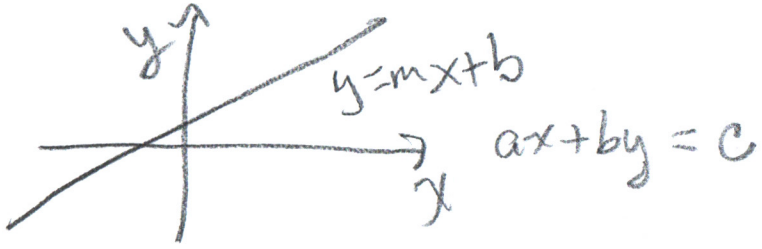

A system $f(x)$ is linear iff

$$f(kx) = kf(x)$$

$$f(x_1+x_2) = f(x_1)+f(x_2)$$

$$f(k_1x_1+k_2x_2) = k_1f(x_1)+k_2f(x_2)$$

$p(a) = 3a+2$

$p(a)$

$p(2) = \$1$

$p(3\times 2) = 3p(2)$

$= 3(\$1) = \$3$

$p(6+2) = p(6)+p(2)$

Is $f(x) = 3x^2$ linear? NO

$f(kx) = 3(kx)^2 = 3k^2x^2$

$kf(x) = 3kx^2$

affine

Is $f(x) = 3x+2$ linear?

$f(kx) = 3(kx)+2$

$= 3kx+2$

$kf(x) = k(3x+2)$

$= 3kx+2k$