Proof of Divisibility of Linear combos

$x \mid y$

$x \mid z$

$y = kx$

$z = jx$

$c = sy + tz$

$\therefore x \mid c$

$\equiv x \mid (sy + tz)$

1.)	$x \mid y$	hypotheses
2.)	$y = kx \wedge x \neq 0$	definition of divides, 1
3.)	$x \neq 0$	Simplification, 2
4.)	$x \mid z$	hypotheses
5.)	$z = jx \wedge x \neq 0$	definition of divides, 4
6.)	$c = sy + tz$	hypotheses
7.)	$c = s(kx) + t(jx)$	substitution, 2, 5, 6
8.)	$c = (sk + tj)x$	algebra, 7
9.)	let $n = sk + tj$	element definition
10.)	n is an integer	sum of integers, 9
11.)	$c = nx \wedge x \neq 0$	substitution conjunction,
12.)	$x \mid c$	definition of divides
13.)	$x \mid sy + tz$	substitution