$R_5$

$$f(x,y,z) = ((x+y-z), -3(x+y-z), -2(x+y-z))$$

$$f(x,y,z) = (x+y-z)\cdot(1,-3,-2) \qquad \forall (x,y,z)$$

$$\Rightarrow \quad \boxed{\mathrm{Im} f = \langle (1,-3,-2) \rangle}$$

en effet $\quad f(e_1) = (1,-3,-2) = \cancel{f(}$
$f(e_2) = (1,-3,-2)$ $\quad \Rightarrow f(e_3) = -f(e_2) = -f(e_1)$
$f(e_3) = (-1,3,2)$

$\underline{\mathrm{Ker} f} = \{ (x,y,z) \in \mathbb{R}^3 \ / \ f(x,y,z) = (0,0,0) \}$.

$f(x,y,z) = (0,0,0) \Rightarrow (x+y-z).(1,-3,-2) = (0,0,0)$

$(1,-3,-2) \neq (0,0,0)$ alors $\underline{\underline{x+y-z=0}} \Rightarrow$

$\underline{\underline{z = x+y}}$

$\Rightarrow f(x,y,z) = (0,0,0) \Rightarrow (x,y,z) = (x,y,x+y)$.

$(x,y,z) = (x,0,x) + (0,y,y) = x\underbrace{(1,0,1)} + y\underbrace{(0,1,1)}$.

$\Rightarrow \quad \underline{\mathrm{Ker} f = \langle (1,0,1), (0,1,1) \rangle}$