

$$(u_1, u_2, u_3) + (v_1, v_2, v_3) = (u_1+v_1, u_2+v_2, u_3+v_3)$$

$$(-3, 7, -5) + (12, -2, -9) = (9, 5, -14)$$

$$\lambda(u_1, u_2, u_3) = (\lambda u_1, \lambda u_2, \lambda u_3)$$

$$-\frac{2}{3}(12, -2, -9) = (-8, \frac{4}{3}, 6)$$

$$\mathbf{u} \parallel \mathbf{v} \Rightarrow (u_1, u_2, u_3) = \alpha (v_1, v_2, v_3) = (\alpha v_1, \alpha v_2, \alpha v_3)$$

$$\begin{cases} u_1 = \alpha v_1 \\ u_2 = \alpha v_2 \\ u_3 = \alpha v_3 \end{cases} \Rightarrow \begin{cases} \alpha = \frac{u_1}{v_1} \\ \alpha = \frac{u_2}{v_2} \\ \alpha = \frac{u_3}{v_3} \end{cases} \Rightarrow \frac{u_1}{v_1} = \frac{u_2}{v_2} = \frac{u_3}{v_3}$$

$$(12, -2, -18) = -2(-6, 1, 9)$$

$$-2 = \frac{12}{-6} = \frac{-2}{1} = \frac{-18}{9}$$