For fixed $b$, this is the vertical plane $y = b$ and...

The limit \[ \lim_{h \to 0} \frac{f(a + h, b) - f(a, b)}{h} \]
equals...

...the slope of the curve $z = f(x, b)$ at $(a, b, f(a, b))$, which is $f_x(a, b)$.

For fixed $a$, this is the vertical plane $x = a$ and...

The limit \[ \lim_{h \to 0} \frac{f(a, b + h) - f(a, b)}{h} \]
equals...

...the slope of the curve $z = f(a, y)$ at $(a, b, f(a, b))$, which is $f_y(a, b)$.