$$
\begin{aligned}
f'(3) &= \lim_{h\to 0} \frac{f(3+h)-f(3)}{h} \\
&= \lim_{h\to 0} \frac{(3+h)^2-9}{h} \\
&= \lim_{h\to 0} \frac{9+6h+h^2-9}{h} \\
&= \lim_{h\to 0} \frac{6h+h^2}{h} \\
&= \lim_{h\to 0} (6+h) \\
&= 6.
\end{aligned}
$$

plugging in

$$
\begin{aligned}
f'(x) &= \lim_{h\to 0} \frac{f(x+h)-f(x)}{h} \\
&= \lim_{h\to 0} \frac{(x+h)^2-x^2}{h} \\
&= \lim_{h\to 0} \frac{x^2+2xh+h^2-x^2}{h} \\
&= \lim_{h\to 0} \frac{2xh+h^2}{h} \\
&= \lim_{h\to 0} (2x+h) \\
&= 2x,
\end{aligned}
$$

so $f'(3) = 6$.

working with x