$\frac{x^{10}-1}{x^3-1}$

$\cancel{\frac{(x-1)(x^9+\cdots+x+1)}{(x-1)(x^2+x+1)}}$

$\lim_{x\to 0} |x| \cos\left(\frac{1}{x^2}\right)$. $-1 < \cos\left(\frac{1}{x^2}\right) < 1$

$= 0 \cdot \cos\left(\frac{1}{x^2}\right)$

$= 0$

3. -26

Given $\varepsilon > 0$ -5

$\lim_{x\to c} (3f(x) + 4g(x)$

$\exists \delta_1$ s.t. $0 < |x-c| < \delta_1 \Rightarrow |f(x)$

-1 $\exists \delta_2$ s.t. $0 < |x-c| < \delta_2 \Rightarrow |g(x$

-10 $\exists \delta_3$ s.t. $0 < |x-c| < \delta_3 \Rightarrow |h(x$

$\delta = \min\{\delta_1, \delta_2, \delta_3\}$

for $0 < |x-c| < \delta$ $\Leftrightarrow |3f(x) + 4g(x) - 5h(x)$

$< \varepsilon$

for all $\varepsilon > 0$, there exists $\delta > 0$

$(x-1)^2 = 4$

$0 < |x-c| < \delta \Rightarrow |f(x) - L| < \varepsilon$