

a) $\lim_{n \rightarrow \infty} \frac{\cos(n^2)}{n} = \boxed{0}$ b/c $\lim_{x \rightarrow \infty} \frac{\cos(x^2)}{x} = 0.$

b) $\lim_{n \rightarrow \infty} \frac{n^3 - 1}{n^3 + 1} = \boxed{1}$ b/c $\lim_{x \rightarrow \infty} \frac{x^3 - 1}{x^3 + 1} = 1$

c) $\lim_{n \rightarrow \infty} (-2)^n$ does not exist

$a_n = (-2)^n$: $-2, 4, -8, 16, -32, \dots$

d) $\lim_{n \rightarrow \infty} \frac{(n+1)!}{n!} = \lim_{n \rightarrow \infty} \frac{(n+1)n!}{n!} = \lim_{n \rightarrow \infty} (n+1) = \underline{+\infty}$
diverges

e) $\lim_{n \rightarrow \infty} e^{1/n} = e^{\lim_{n \rightarrow \infty} 1/n} = e^0 = \boxed{1}$

b/c $f(x) = e^x$
 is continuous