

$$6. \quad \lim_{x \rightarrow \infty} \frac{x^2 + \sin x}{x^2 + \cos x} = \lim_{x \rightarrow \infty} \frac{1 + \frac{\sin x}{x^2}}{1 + \frac{\cos x}{x^2}} = \frac{1}{1} = 1$$

We have used the fact that $\lim_{x \rightarrow \infty} \frac{\sin x}{x^2} = 0$ (and similarly for cosine) because the numerator is bounded while the denominator grows large.