

## Topic 4: Limits at infinity

Determine the following limits (answer as appropriate, with a number,  $\infty$ ,  $-\infty$  or does not exist).

$$1. \lim_{x \rightarrow -\infty} \frac{-x}{\sqrt{4+x^2}}$$

$$2. \lim_{x \rightarrow \infty} \frac{x^3 - 2x + 5}{3x^2 + 4x - 1}$$

$$3. \lim_{x \rightarrow \infty} \frac{x^2 - \sin x}{x^2 + 4x - 1}$$

$$4. \lim_{x \rightarrow \infty} \left( \sqrt{x^2 + 3} - x \right)$$

$$5. \lim_{x \rightarrow \infty} e^{2x}$$

$$6. \lim_{x \rightarrow \infty} \sin 2x$$

$$7. \lim_{x \rightarrow \infty} \left( e^{-3x} \cos 2x \right)$$

$$8. \lim_{x \rightarrow \infty} \ln 2x$$

Answers

$$1) 1 \quad 2) \infty \quad 3) 1 \quad 4) 0$$

$$5) \infty \quad 6) DNE \quad 7) 0 \quad 8) \infty$$