

# Quiz 1 Solution

$$58) \quad z(x) = \begin{cases} kx^2, & x < 2 \\ x^3, & x > 2 \end{cases}$$

$$a) \quad \lim_{x \rightarrow 2^-} z(x) = \lim_{x \rightarrow 2^-} kx^2 = k(2)^2 = 4k$$

by the direct substitution property since  $kx^2$  is a polynomial.

$$b) \quad \lim_{x \rightarrow 2^+} z(x) = \lim_{x \rightarrow 2^+} x^3 = (2)^3 = 8$$

direct substitution

c) In order for  $\lim_{x \rightarrow 2} z(x)$  to exist we need  $\lim_{x \rightarrow 2^-} z(x) = \lim_{x \rightarrow 2^+} z(x)$

In other words, we need  $4k = 8$ .

This happens when  $k = 2$ .