

Properties of Continuity

p. 117 - 125 (2.4)

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1. Scalar multiple bf
 2. Sum & Difference $f \pm g$
 3. Product fg
 4. Quotient $\frac{f}{g}$ if $g(c) \neq 0$
 5. If g is continuous and f is continuous then $f \circ g(x) = f(g(x))$ is continuous.
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**1. Which of the following functions are continuous for all real numbers x ?

I. $y = x^{2/3}$ ✓

II. $y = e^x$ ✓

III. $y = \tan(x)$ ✗

(A) None (B) I only (C) II only (D) I and II (E) I and III

2. For what value of the constant c is the function f continuous over all the reals?

$$f(x) := \begin{cases} cx + 1 & \text{if } x \leq 3 \\ c(x)^2 - 1 & \text{if } x > 3 \end{cases}$$

$$cx + 1 = c(x)^2 - 1 \quad @ \quad x = 3$$

$$3c + 1 = 9c - 1$$

$$6c = 2$$

$$c = \frac{1}{3}$$