ATTENDANCE QUIZ (FUNCTIONS AND LIMITS)

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Print your **name** and **three digit section number** in the top right corner, then make an attempt.[1] These problems do *not* count towards your final grade. You have about 2 minutes a question.

- Consider the function $f(x) := x^2 + 1$. What is the polynomial describing $f(f(x))$?

  a. $x^2 + 2$
  b. $x^4 + x^2 + 1$
  c. $x^4 + x^2 + 2$
  d. $x^4 + 2x^2 + 1$
  e. $x^4 + 2x^2 + 2$

- If $f(g(x)) = 5$ and $f(x) = x + 3$ for all real x, then $g(x) =$

  a. $x - 3$
  b. $3 - x$
  c. $\frac{5}{x+3}$
  d. 2
  e. 8

- For all positive functions f and g of the real variable x, let $\sim$ be a relation defined by

$$f \sim g \text{ if and only if } \lim_{x\to\infty} \frac{f(x)}{g(x)} = 1.$$

  Which of the following is NOT a consequence of $f \sim g$?

  a. $f^2 \sim g^2$
  b. $\sqrt{f} \sim \sqrt{g}$
  c. $e^f \sim e^g$
  d. $f + g \sim 2g$
  e. $g \sim f$

References

- Vipul Naik, *Math 152 Week 1*. https://vipulnaik.com/math-152/.
- GRE Mathematics Test Form GR0568 and Form GR9367.

Date: 2018-08-30.
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Repo: https://github.com/coltongrainger/pro19ta.

[1] https://en.wikipedia.org/wiki/Kobayashi_Maru