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Teaching Topics Effectively: Domain and Range of Functions From Algebra Through Calculus

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Texas Instruments

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Agenda

- Welcome & Introductions
- Investigate functions graphically and numerically
  - Composite functions
  - Piecewise functions
- Introduction to Dynagraphs on TI-Nspire™ Technology
- Explore applied problems using graphs and solve (TI-84 and Nspire)
- Visualize Domain and Range using Nspire activity - "Exploring Domain and Range"
- Engage with Parametric Equations and Discrete functions (if time)

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Expected Outcomes

I CAN visualize domain and range graphically and use numerical representations to investigate restrictions

I CAN use the TI-Nspire™ CX II and TI-84 CE to explore functions, domain, and range.

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I CAN explore different functions including restrictions and applications.

Visualizing Domains of Composite Functions (ACT question)

Two functions are defined below. What is the domain of: $f(g(x))$?

$f(x) = \sqrt{x} - 1$ and $g(x) = (2 - x)^3$

A. $(-\infty, 0]$

B. $(-\infty, 1]$

C. $(-\infty, 2]$

D. $(-\infty, 4]$

E. $(-\infty, \infty)$

Domain in Context - Applications

A man has 340 meters of fencing for enclosing two fields, one of which is to be a rectangle twice as long as it is wide and the other is a square. The square field must contain at least 100 m^2 and the rectangular one must contain at least 800 m^2.

a) If x is the width of the rectangular field, what are the maximum and minimum possible values of x?

b) What is the greatest number of square meters that can be enclosed in the two fields. Justify.

Domain in Context – AP* Calc

A particle moves along the x-axis so that its velocity at time t is given by

$$v(t) = -(t+1)\sin\left(\frac{t^2}{2}\right).$$

Find all times t in the open interval $0 < t < 3$ when the particle changes direction.

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Q&A

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