Mathematical Methods: Choosing your Relations

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Description

It is often said that “You can choose your friends but you can’t choose your relations”.

Well, this is simply not true when it comes to TI-Nspire technology!

If graphing circles was an Olympic event TI-Nspire would run rings around the entire logo. You can also graph parabolas in the form $y=x^2$ or $y^2 = x$ including the axis of symmetry, focus and directrix. From origami to differential calculus, we’ll cover everything you need to know about relational graphing on TI-Nspire.

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Webinar Overview

- TI-Nspire CX features for functions & Relations
- Applications ready for classroom use

QLD Curriculum

- Australian Curriculum Yr 10:
  - ACMNA239 – Explore the connection between algebraic and graphical representations or relations such as quadratics, circles and exponentials using digital technology as appropriate.
- Australian Curriculum Yr 10A:
  - ACMNA267 - Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations

- Math Methods:
  - Unit 1 Topic 2 -

- understand the concept of a relation as a mapping between sets, a graph and as a rule or a formula that defines one variable quantity in terms of another
- recognise the distinction between functions and relations and use the vertical line test to determine whether a relation is a function

- recognise features of the graphs of $y = \frac{1}{x}$ and $y = \frac{a}{(x-b)}$, including their hyperbolic shapes, their intercepts, their asymptotes and behaviour as $x \to \infty$ and $x \to -\infty$.

- recognise and determine features of the graphs of $y = x^3, y = a(x-b)^3 + c$ and $y = k(x-a)(x-b)(x-c)$, including shape, intercepts and behaviour as $x \to \infty$ and $x \to -\infty$

- recognise and determine features of the graphs $y = a(x-b)^4 + c$, including shape and behaviour

Graphs of relations (3 hours)

In this sub-topic, students will:

- recognise and determine features of the graphs of $x^2 + y^2 = r^2$ and $(x-a)^2 + (y-b)^2 = r^2$, including their circular shapes, centres and radii
- recognise and determine features of the graph of $y^2 = x$, including its parabolic shape and axis of symmetry.

- Assessment

It is suggested that schools develop:

- a problem-solving and modelling task that assesses Unit 1 Topic 2, and
- an internal examination that representatively samples subject matter from Unit 1 not assessed in the problem-solving and modelling task.

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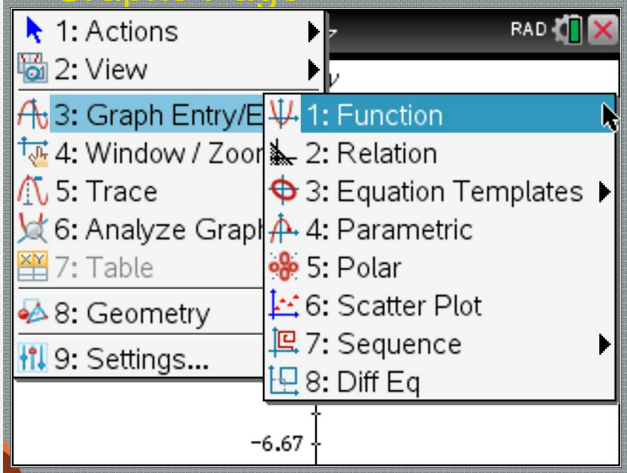
TI-Nspire Features for Graphing

- Graphs Page



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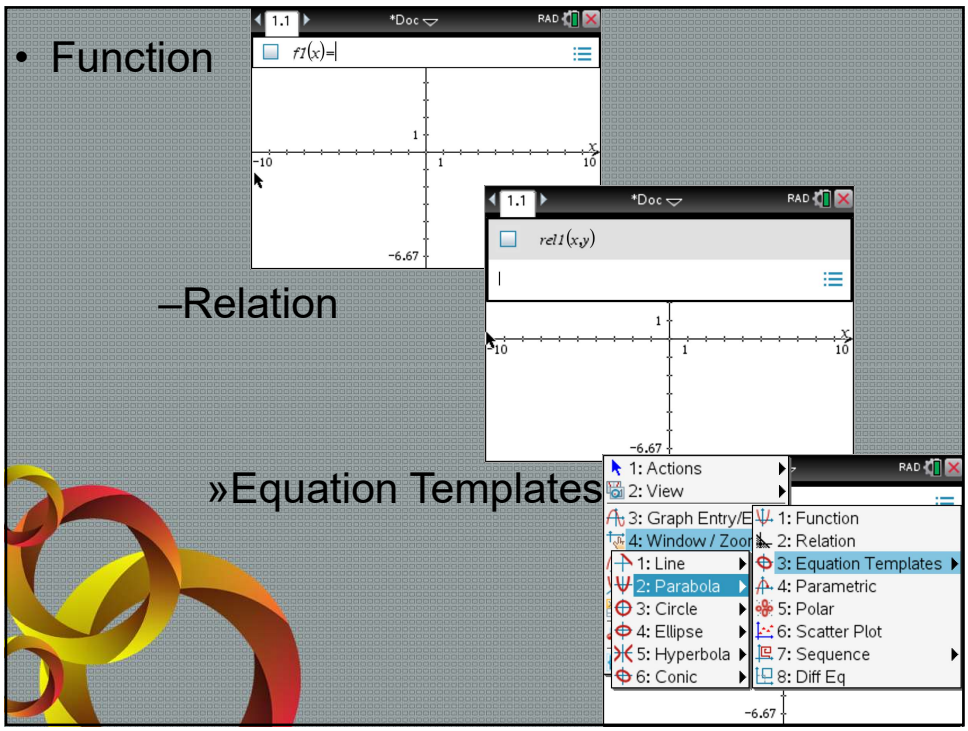
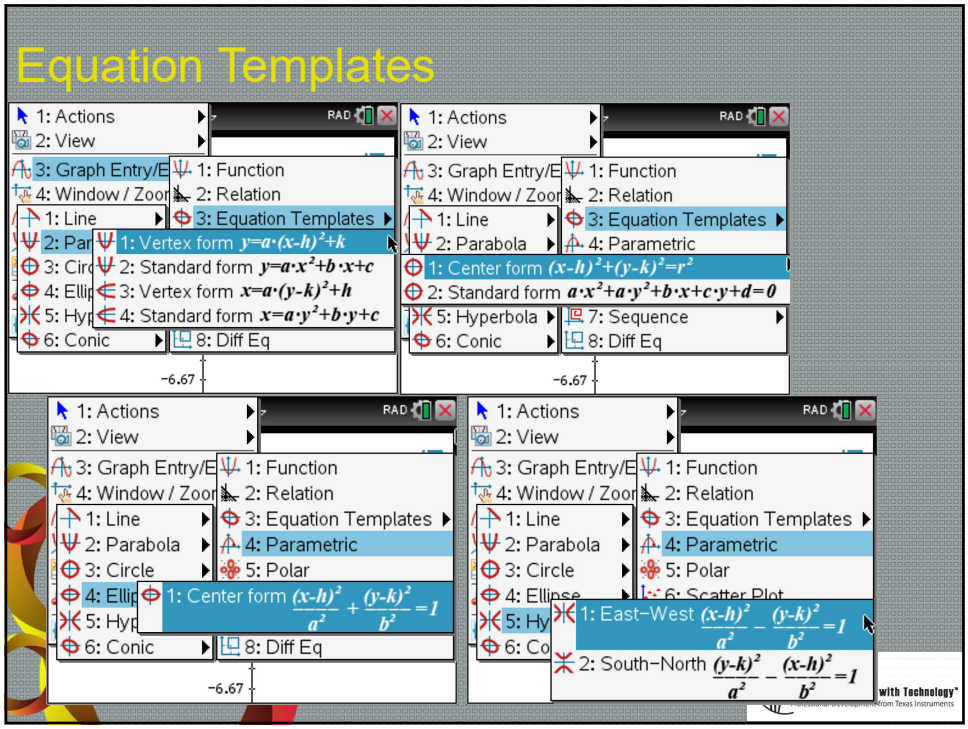

• Function
–Relation
»Equation Templates
1: Actions
2: View
3: Graph Entry/E
4: Window / Zoo
1: Line
2: Parabola
3: Circle
4: Ellipse
5: Hyperbola
6: Conic
1: Function
2: Relation
3: Equation Templates
4: Parametric
5: Polar
6: Scatter Plot
7: Sequence
8: Diff Eq


Equation Templates
1: Vertex form y=a·(x-h)²+k
2: Standard form y=a·x²+b·x+c
3: Vertex form x=a·(y-k)²+h
4: Standard form x=a·y²+b·y+c
1: Center form (x-h)²+(y-k)²=r²
2: Standard form a·x²+a·y²+b·x+c·y+d=0
1: Center form (x-h)²/a² + (y-k)²/b² = 1
1: East-West (x-h)²/a² − (y-k)²/b² = 1
2: South-North (y-k)²/a² − (x-h)²/b² = 1