

# Do you want to build a snowman?



## Student Worksheet

7 8 9 10 11 12



TI-Nspire



Investigation



Student



60+ min

## Context

Disney and Pixar use a range of mathematical techniques to create their animations.

[https://youtu.be/\\_IZMVMf4NQ0](https://youtu.be/_IZMVMf4NQ0)

## Aim

Design another version of Olaf using the functions/relations investigated in class. Your design must fit in a standard window and use at least three different equations. Discuss any strengths, limitations and assumptions throughout your investigation.

## To complete this task, you must:

- use the problem-solving and mathematical modelling approach to develop your response
- respond with a range of understanding and skills, such as using mathematical language, appropriate calculations, tables of data, graphs and diagrams
- provide a response that highlights the real-life application of mathematics
- respond using a written report format that can be read and interpreted independently of the instrument task sheet
- develop a unique response
- use both analytic procedures and technology

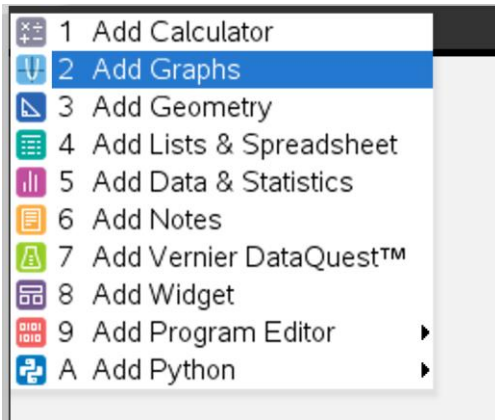


### Remember to:

- Open a new graphing page
- Use the TAB button to add a new graph
- Type in the general formula for the function/relation
- Add sliders in for each co-efficient
- Ensure you put a \* between the co-efficient and x
- You will find a lot of commands under the menu button, 6: Analyse Graph

## How to create sliders:

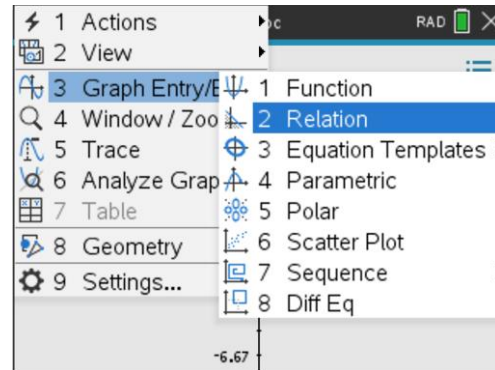
1. Start by adding a new Graph application:



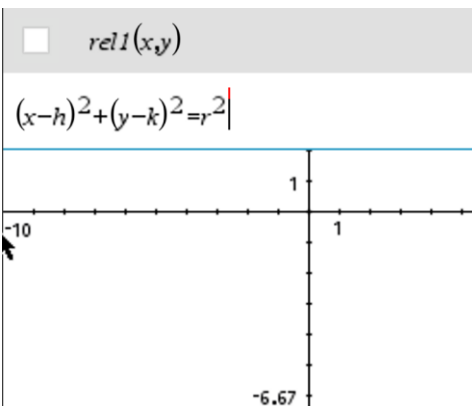
2. Add a relation by going to the Menu button –

3: Graph Entry/Edit – 2: Relation

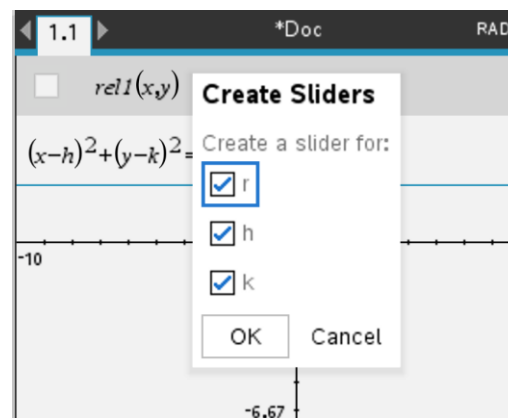
This will allow you to enter any function or relation.



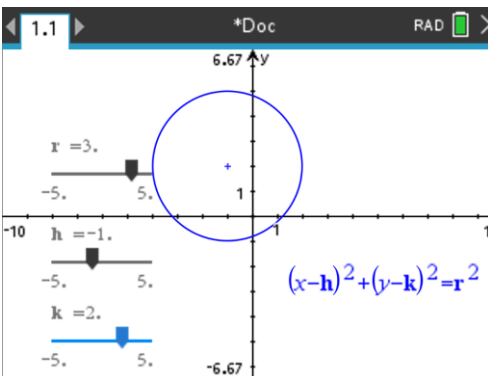
3. Enter your standard form for a circle using the keyboard and push Enter.



4. It will come up as below:



5. Now you can change the value of the sliders to see the changes each variable has on the circle.



6. To add another graph, push the Tab button and repeat the steps above for different functions.

Use the skills in this activity to build your Snowman. You could use any combination of graphs to make your Snowman unique.

Linear Equations	Parabolic Equations	Exponential Equations	Hyperbolic Equations	Circles (Relations)
$y = mx + c$	$y = ax^2 + bx + c$ $y = a(x - h)^2 + k$	$y = ab^{x-h} + k$	$y = \frac{a}{x - h} + k$	$r^2$ $= (x - h)^2$ $+ (y - k)^2$
$m =$	$a =$	$a =$	$a =$	$r =$
$c =$	$h =$	$b =$	$h =$	$h =$
<i>Parallel =</i>	$k =$	$h =$	$k =$	$k =$
<i>Perpendicular =</i>	$(h, k) =$	$k =$	$(h, k) =$	$(h, k) =$
<i>Sketch</i>	<i>Sketch</i>	<i>Sketch</i>	<i>Sketch</i>	<i>Sketch</i>
<i>Reflection is created by?</i>	<i>Reflection is created by?</i>	<i>Reflection is created by?</i>	<i>Reflection is created by?</i>	

## Instrument-specific marking guide (ISMG)

### Criterion: Formulate

#### Assessment objectives

1. Select, recall and use facts, rules, definitions and procedures from linear and non-linear relationships
2. Comprehend mathematical concepts and techniques drawn from linear and non-linear relationships
3. Justify procedures and decisions by explaining mathematical reasoning

### Criterion: Solve

#### Assessment objectives

4. Select, recall and use facts, rules, definitions and procedures from linear and non-linear relationships
5. Solve problems by applying mathematical concepts and techniques drawn from linear and non-linear relationships

### Criterion: Evaluate and verify

#### Assessment objectives

6. Evaluate the reasonableness of solutions
7. Justify procedures and decisions by explaining mathematical reasoning

### Criterion: Communicate

#### Assessment objective

8. Communicate using mathematical, statistical and everyday language and conventions