

'Maths with no Wires Attached'



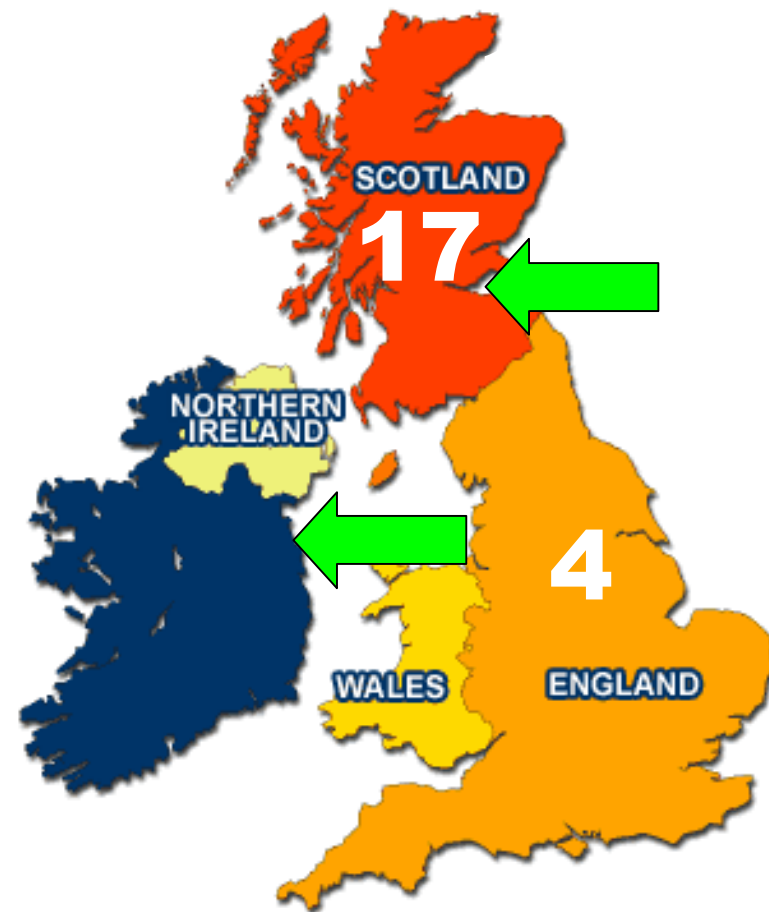
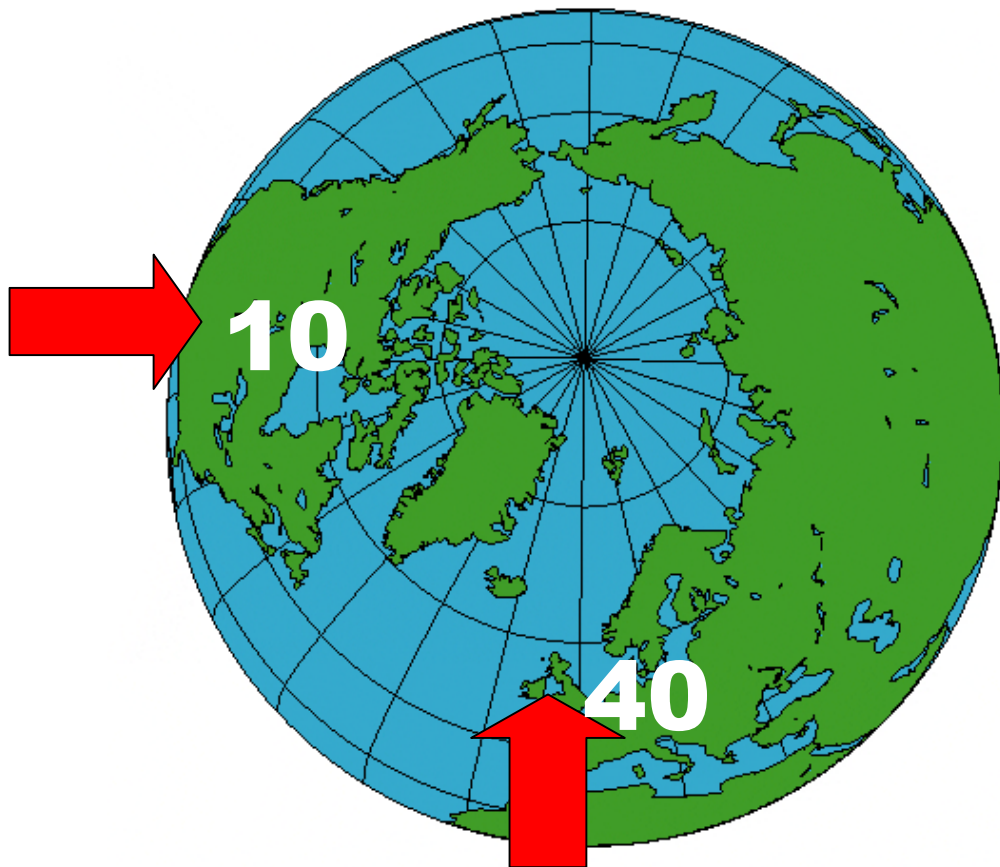
Maths

Mathsfest Conference
Saturday 12th October 2013

Nevil Hopley
Head of Mathematics
George Watson's College
(11-18 yrs Secondary School)
Edinburgh
Scotland

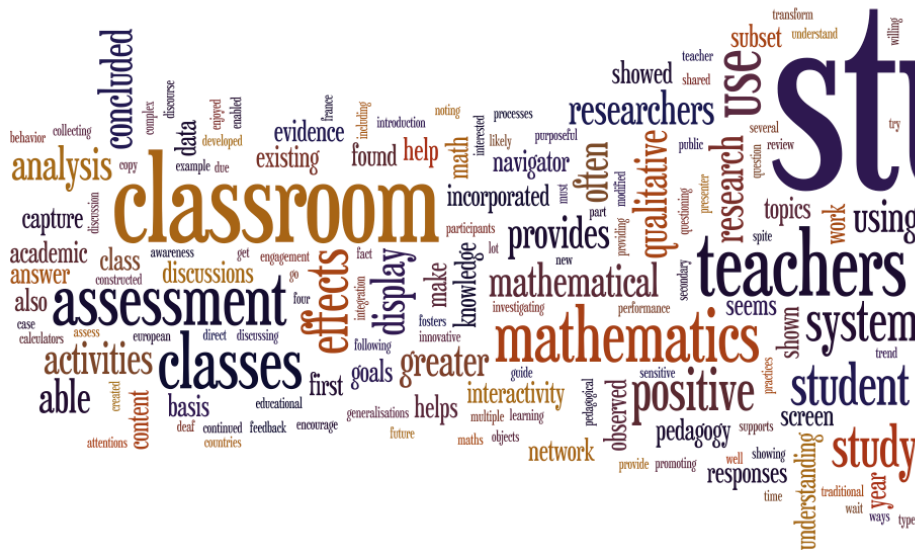
www.calculatorsoftware.co.uk/nspire

Home is 218 miles away on a Bearing of 035°



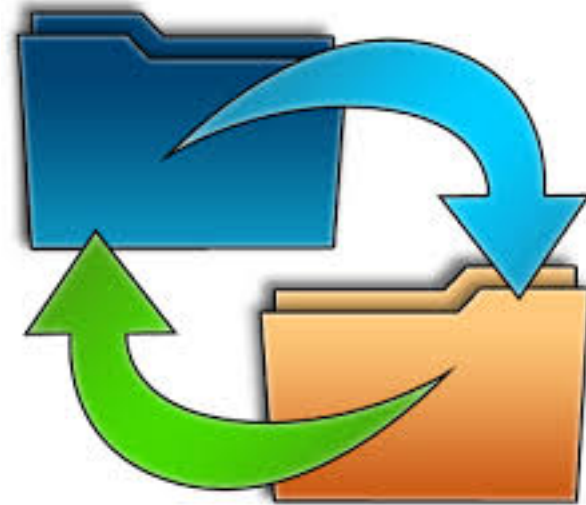


Support

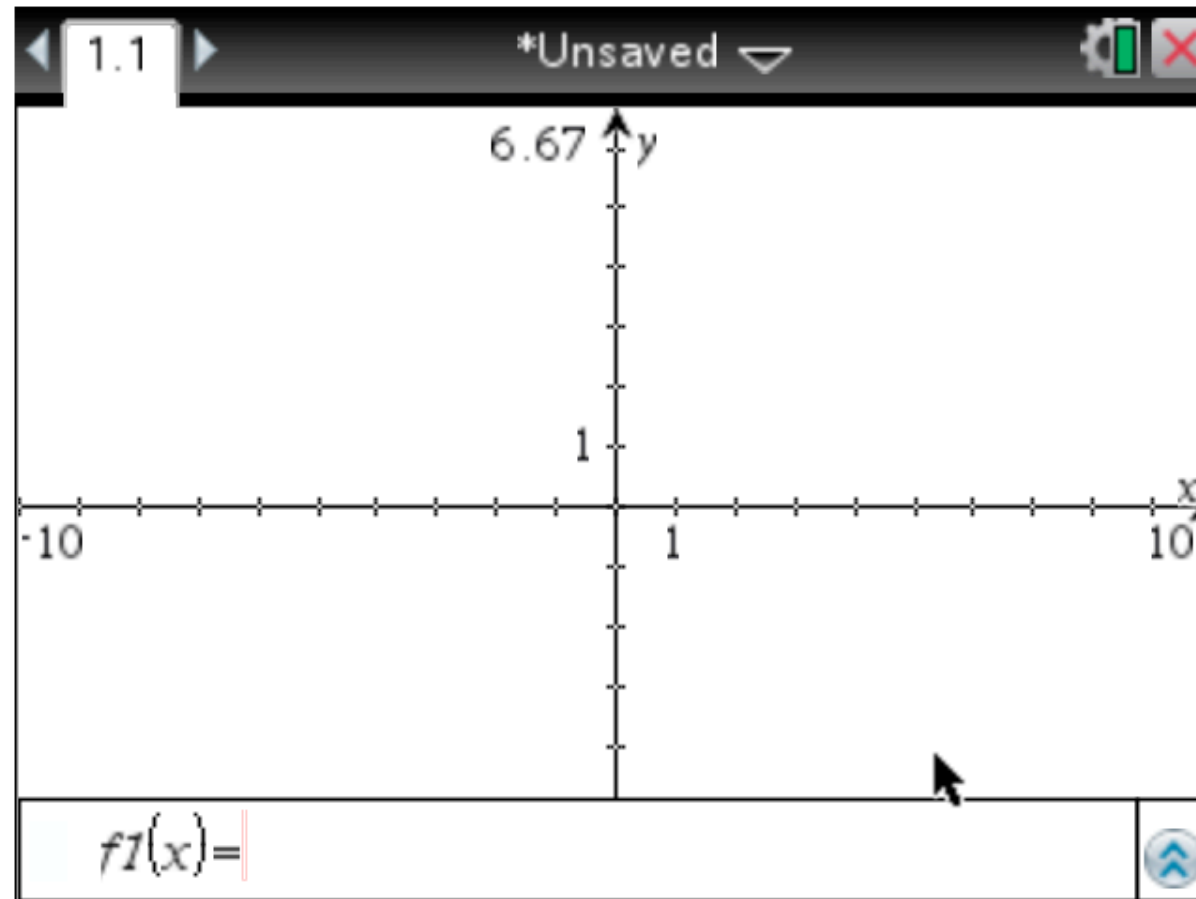


students

Ti-Nspire Navigator Features



Graphs



1.1 2.1 3.1 Maths with N...hed

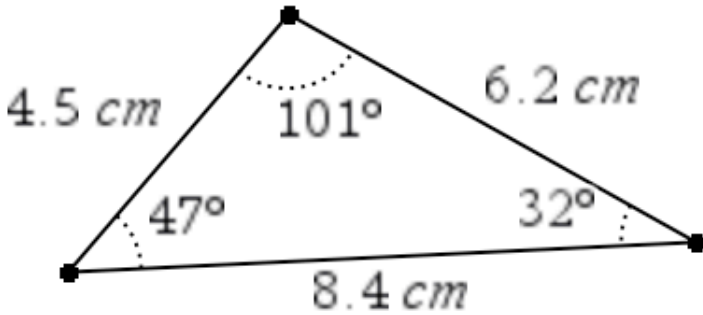
Enter coordinates

(,)
(,)
(,)
(,)
(,)



Triangle Minimum Information

1.1 | 2.1 | 3.1 | Maths with N...hed




4.5 cm 101° 6.2 cm
47° 32°
8.4 cm

Here is a triangle with 6 pieces of information on it. But are all 6 pieces **really** needed in order to draw it **uniquely**?

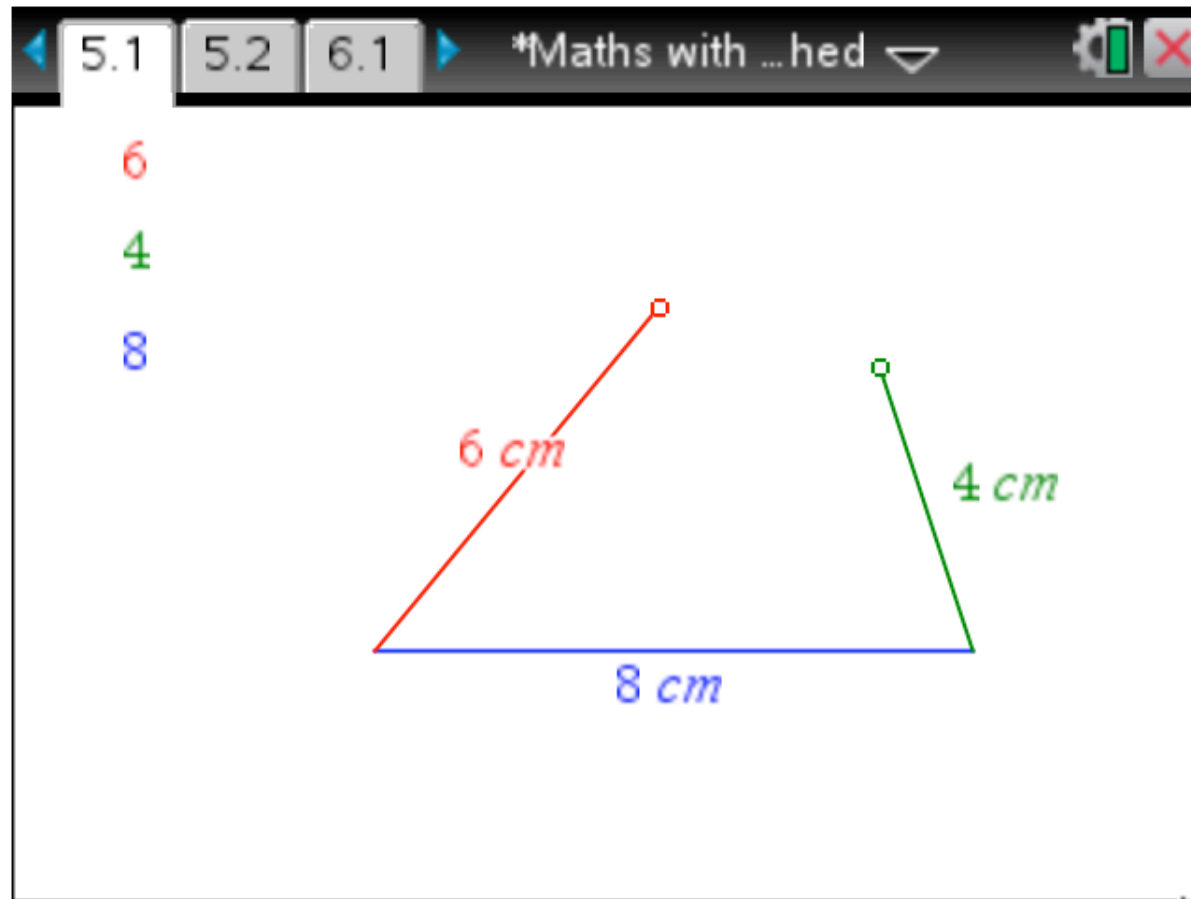
>> *turn to next page [CTRL ▶]*

Class Summary Student Item

 **69%**
 High: 100%
 Median: 70%
 Low: 40%

Students ▲	1	2	3	4	5	6	7	8	9	10	Score	% Sc...	Exclu...
Maximum Score	1	1	1	1	1	1	1	1	1	1	10	100%	
Armstrong-Wright, Rebecca	1	1	1	1	1	1	0	0	1	1	8	80%	<input type="checkbox"/>
Benassi, Amelia	1	1	1	1	1	1	0	0	1	1	8	80%	<input type="checkbox"/>
Blaikie, Chris	1	1	1	1	0	1	0	0	0	1	6	60%	<input type="checkbox"/>
Burton, James	1	0	1	1	1	1	1	1	0	1	8	80%	<input type="checkbox"/>
Greig, Shaun	1	0	1	0	1	0	1	1	1	0	6	60%	<input type="checkbox"/>
Lawrie, Cameron	1	1	1	0	1	1	0	0	1	1	7	70%	<input type="checkbox"/>
Leslie, Gregor	1	1	1	1	1	1	1	1	1	1	10	100%	<input type="checkbox"/>
Lowe, David	1	1	0	0	1	1	0	0	0	1	5	50%	<input type="checkbox"/>
Macdonald, Jamie	1	0	1	1	1	0	1	1	0	1	7	70%	<input type="checkbox"/>
MacEwan, Alasdair	1	1	1	1	1	1	0	0	0	1	7	70%	<input type="checkbox"/>
Marasa, Luca	1	0	1	1	0	1	1	0	1	1	7	70%	<input type="checkbox"/>
Murdoch, Cameron	1	0	1	0	1	1	0	0	0	0	4	40%	<input type="checkbox"/>
Orr, Kirsten	1	0	1	1	0	1	0	0	1	1	6	60%	<input type="checkbox"/>
Rowell, Angus	1	1	0	0	1	1	1	1	0	1	7	70%	<input type="checkbox"/>
Salisbury, Rowan	1	1	1	0	1	1	1	1	0	0	7	70%	<input type="checkbox"/>
Steel, Murray	1	1	1	1	1	1	0	0	0	0	6	60%	<input type="checkbox"/>
Storey, Abigail	1	1	1	0	1	1	0	0	0	1	6	60%	<input type="checkbox"/>
Taylor, Lily	1	1	1	1	1	1	0	0	1	1	8	80%	<input type="checkbox"/>
Tink, Joanna	1	0	1	1	1	1	0	1	0	1	7	70%	<input type="checkbox"/>
Venus, Mollie	1	1	0	1	1	1	1	0	0	1	7	70%	<input type="checkbox"/>
Watson, Duncan	1	0	1	1	0	1	1	1	0	1	7	70%	<input type="checkbox"/>
Item Average	100%	62%	86%	67%	81%	90%	43%	38%	38%	81%	6.86	69%	
Exclude Item:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Triangle Side-Side-Side



1.1 1.2 1.3 1.4 DEG AUTO REAL

the sides must add up to more than ten

Angus

1.1 1.2 1.3 1.4 DEG AUTO REAL

i think that two of the numbers have to be a multiple of three

CameronM

1.1 1.2 1.3 1.4 DEG AUTO REAL

my theory is that the shorter the base line the better the other 2 lines connect :-)

Jamie

1.1 1.2 1.3 1.4 DEG AUTO REAL

i think that least one number has to be more than half of the bottom one, in most cases.

Gregor

1.1 1.2 1.3 1.4 DEG AUTO REAL

my theory is that there has got to be either two odd numbers and an even or two even numbers and an odd (number that is)

Lily

1.1 1.2 1.3 1.4 DEG AUTO REAL

i have no clue i don't think there is any logic behind the triangle with circles.

Mollie

1.1 1.2 1.3 1.4 DEG AUTO REAL

the two smallest sides of the triangle have to add up to more than the longest side for this to work as when you do the circle thing they need to overlap at some point.

Rowan

Play with a Template

The screenshot shows a mobile application interface for a math problem. At the top, there is a navigation bar with three tabs labeled '6.1', '7.1', and '8.1'. The '8.1' tab is currently selected. To the right of the tabs is a title '*Maths with ...hed' and a dropdown arrow. Further right are icons for settings and a close button. Below the navigation bar, there are three radio button options, each with a horizontal line underneath it. The first option is $\textcircled{\ominus}^{-0.5}\sqrt{16}$, the second is $\textcircled{\ominus}^{-3}\sqrt{8}$, and the third is $\textcircled{\ominus}^{-2}\sqrt{16}$. A vertical scrollbar is on the right side of the list. At the bottom right of the screen, the text '3/99' is displayed.

Perpendicular Gradients

The two lines are perpendicular

text

How are the two triangles related?

»

A
◆
1 thick
2 $-4/5$
3
4 thin
5 $5/4$
6

A1 thick

3.3 3.4 3.5 3.6 DEG AUTO REAL ctrl

The two lines are perpendicular

How are the two triangles related?

1 thick
2 -6/5
3
4 thin
5 5/6

A1 thick

EkaterinaS

3.3 3.4 3.5 3.6 DEG AUTO REAL

Explain how to get the gradient of the thin line from the thick line.

the verticle length of the thick line = the horizontil length of the thin line.

JaneyM

3.4 3.5 3.6 4.1 DEG AUTO REAL

Explain how to get the gradient of the thin line from the thick line.

as they are perpindiculer the x component becomes the y and vice versa there for the gradient is flipped and changes from positive to negative or the other way around.

CallumS

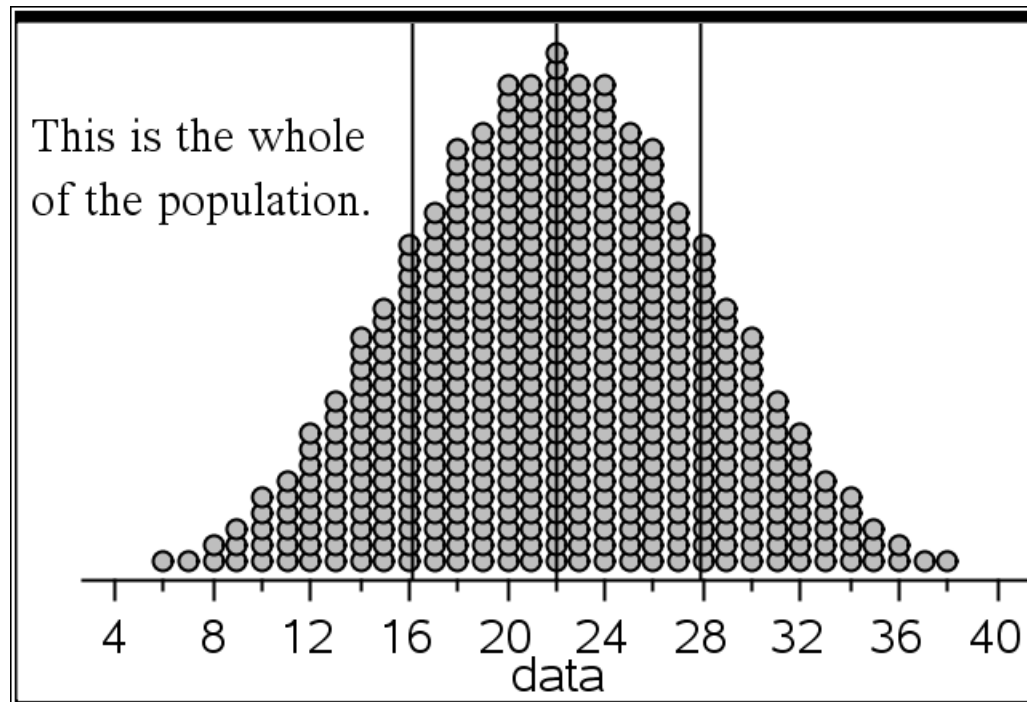
3.4 3.5 3.6 4.1 DEG AUTO REAL

Explain how to get the gradient of the thin line from the thick line.

the longest side of the thick line triangle is equal to the longest side on the thin line trianle. The same applies with the two shorter sides. and now negative.

MairiD

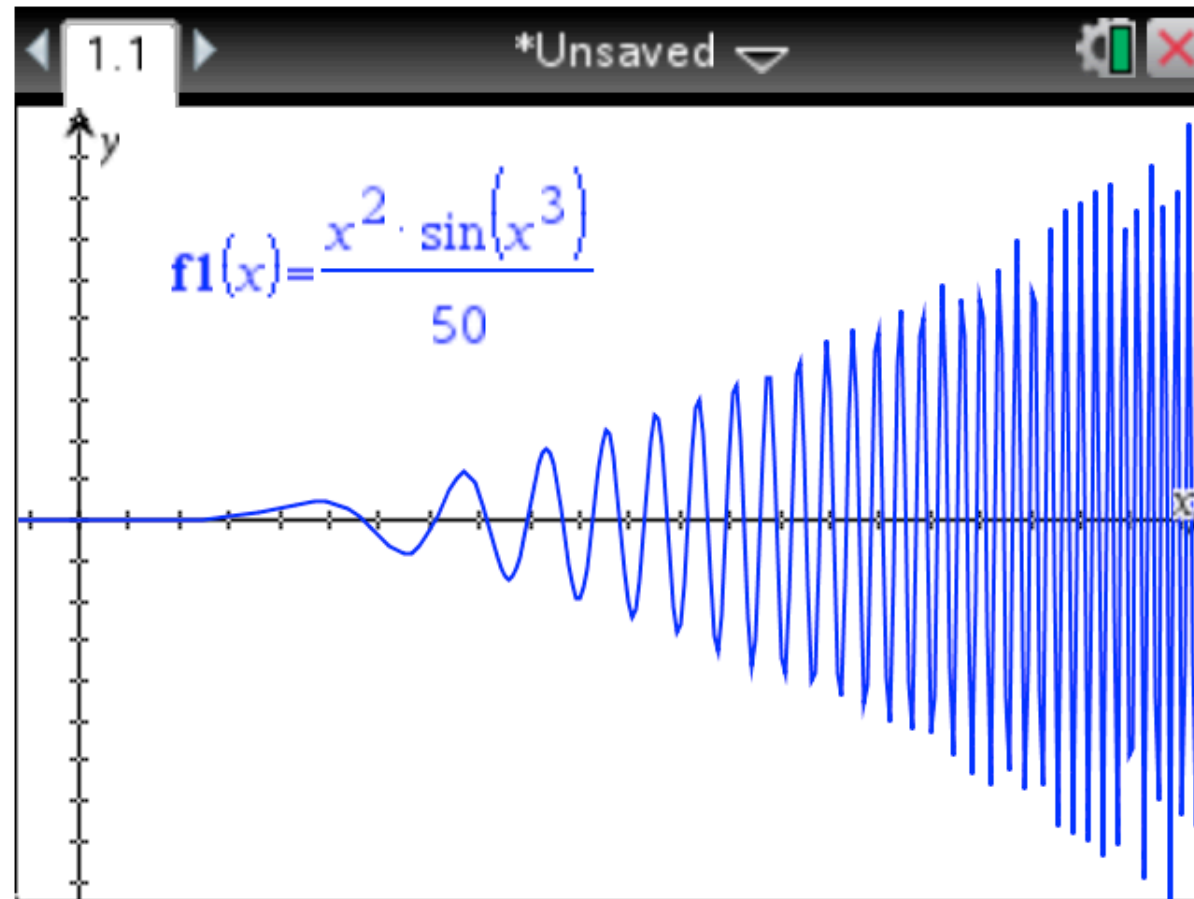
Standard Deviation Divisor



$$\text{sample st. dev.} = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n-1}}$$

$$\text{population st. dev.} = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n}}$$

What has Nspire Navigator changed?



What has Nspire Navigator exposed?

My shortcomings at asking questions that 'draw out' the learning objective(s) from them, without taking the lesson away from them.

What has Nspire Navigator not changed?

The value of one-on-one discussions, separate from the whole class collective experience that it offers.

What My Students Have Said (1 of 3)

Louise said:

“I think it is quite interesting to share ideas and it's even more interesting when people have completely different ideas about things because you get to think of ideas in a perspective that you might not have thought of”

What My Students Have Said (2 of 3)

Ben said:

“I like it when we use the wireless networks, I suppose it gives a feeling of solidarity to the class and is also a very efficient way of teaching.”

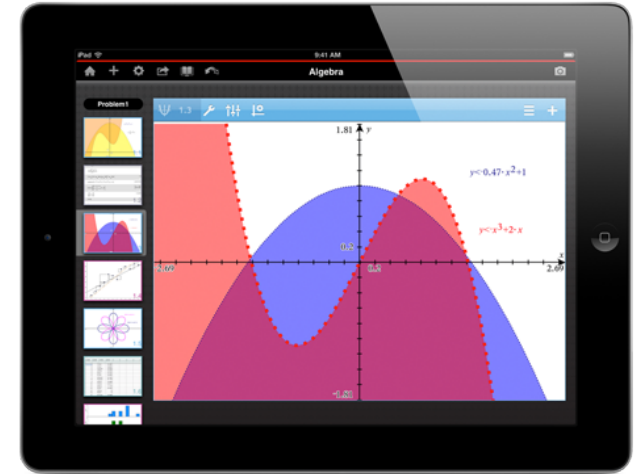
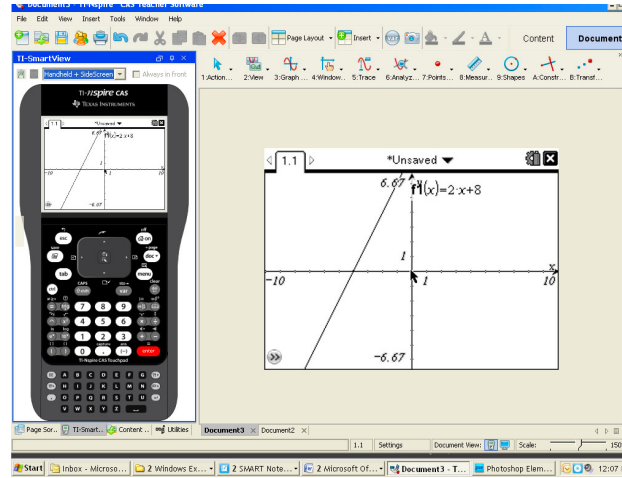
What My Students Have Said (3 of 3)

Katie said:

“Do actually do the playing prior to lessons.
Because it really does help even though it doesn't seem that helpful at the time and it engages your attention as to WHY we were playing with it.

AND do what you're meant to do for homework because the next day in the screen capture it's embarrassing if you haven't done it.”

TI-Nspire Platforms Available



www.CalculatorSoftware.co.uk/nspire

for...

all of this talk's materials

details of free software trials

details of free handhelds loans

link to the TI-Nspire iPad App from iTunes

links to the global Nspire Maths Community!

Thank you for coming along to this Session

Nevil Hopley