

## MPM 1D

### LINEAR & NON-LINEAR RELATIONS

Compare the 2 columns of relations.

LINEAR	NON-LINEAR
$y = 2x$	$y = x^2 - 2$
$y = -\frac{3}{4}x + 1$	$y = 2x^3 - x^2 + 3$
$2x + 5y = 1$	$y = 2^x$
$x - 4y + 2 = 0$	$y = \frac{6}{x}$
$y = -3$	$y = \sqrt{x + 2}$

What defines a linear relation?

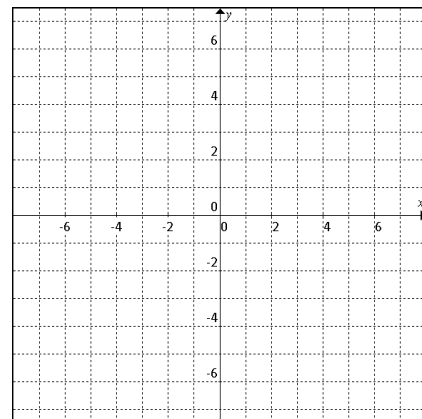
What defines a non-linear relation?

**EXAMPLES:** For each relation,

- Prepare a table of values.
- Use the first differences to state whether the relation is linear or non-linear.
- Sketch the graph.

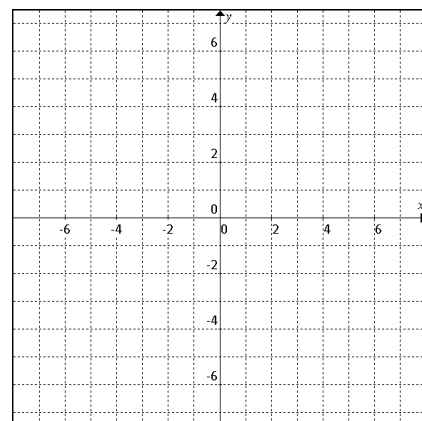
1.  $y = -\frac{1}{2}x + 5$

$x$	$y$	1st diff.



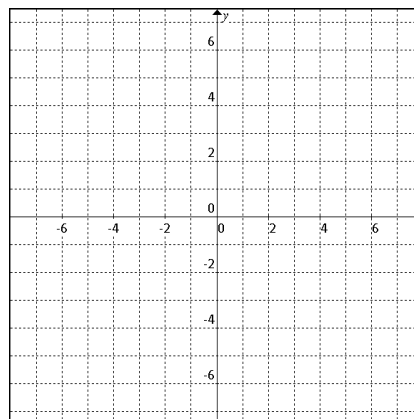
2.  $y = 2^x - 3$

$x$	$y$	1st diff.



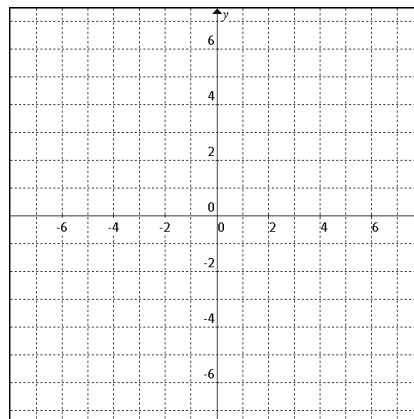
3.  $y = x^2 - 4x + 3$

$x$	$y$	1st diff.



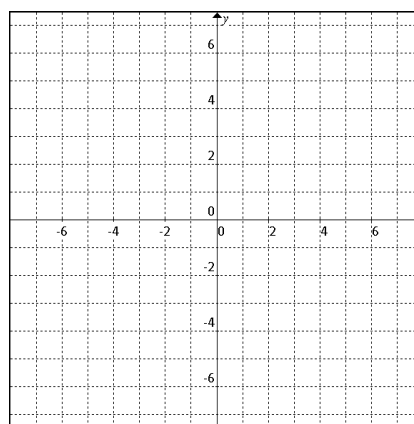
4.  $y = 6 - x^2$

$x$	$y$	1st diff.



5.  $xy = 8$

$x$	$y$	1st diff.



6.  $y = (0.5)^x - 2$

$x$	$y$	1st diff.

