# Formulae, tables and graphs	Season	01
	Episode	08
	Time frame	1 period

Objectives :
- See the various ways to represent a function.
- Answer questions using the various representations.

Materials :
- *Formulae, table of values, graphs and variations tables for five functions.*
- *Questions about each function.*

1 – Matching game — 15 mins

Students are handed out a formula, a table of values, a graph or variations table and have to find the ones related to the same function.

2 – Questions — 40 mins

Working in teams, students answer a series of questions about their function.

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	Document	Questions

Answer the following questions about the function f. In each case, tell what representation of the function you're using to answer the question : formula, table of value, graph or table of variations. Numerical answers may be approximate values.

1. Give the images under f of the numbers -4, -1 and 2, if they exist. Answer with complete sentences.
2. Give the preimages under f of the numbers -1, 0 and 1, if they exist.
3. For what values of x is it possible to compute $f(x)$?
4. For what values of x is $f(x)$ positive ? For what values is it negative ?
5. For what values of x is f increasing ? For what values is it decreasing ?
6. Does the function f admit any maxima and/or minima over the interval $[-4; 4]$? If so, what are their values and for what values of x do we find them.
7. For what values of x is f such that $f(x) \geqslant 2$?
8. For what values of x is f such that $f(x) \leqslant x$?
9. What is the tendency of $f(x)$ when x approaches $+\infty$ (which means becomes greater and greater) ?

Document 1 Formulae, tables and graphs

$f(x) = x^2 - x - 5$
$f(x) = \frac{01}{x-2}$
$f(x) = \frac{1}{4}x^3 - x$
$f(x) = \sqrt{x+3}$
$f(x) = \lvert 2x - 2 \rvert$

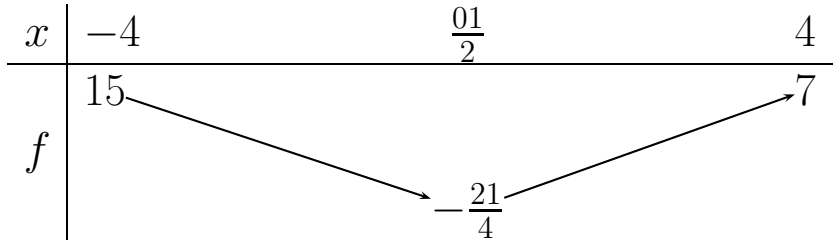
x	-4	-3	-2	-1	0	1	2	3	4
$f(x)$	15	7	1	-3	-5	-5	-3	1	7

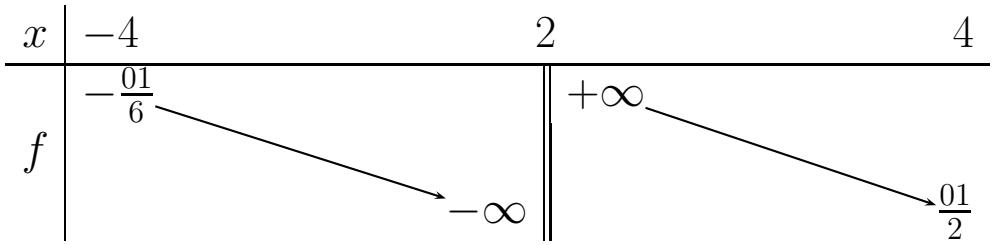
x	-4	-3	-2	-1	0	1	2	3	4
$f(x)$	$-\frac{1}{6}$	$-\frac{1}{5}$	$-\frac{1}{4}$	$-\frac{1}{3}$	$-\frac{1}{2}$	-1		1	$\frac{1}{2}$

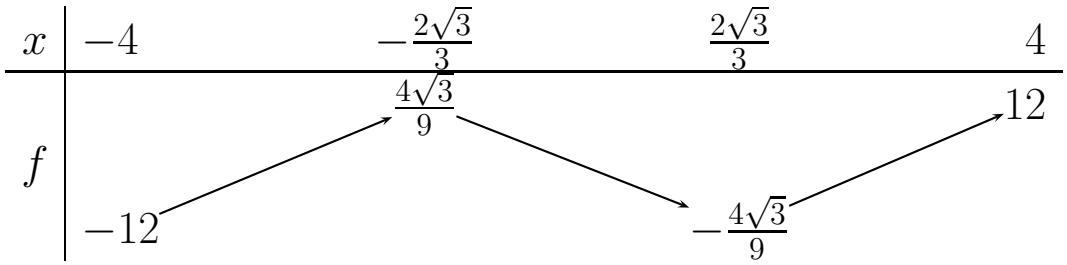
x	-4	-3	-2	-1	0	1	2	3	4
$f(x)$	-12	$-\frac{15}{4}$	0	$\frac{3}{4}$	0	$-\frac{3}{4}$	0	$\frac{15}{4}$	12

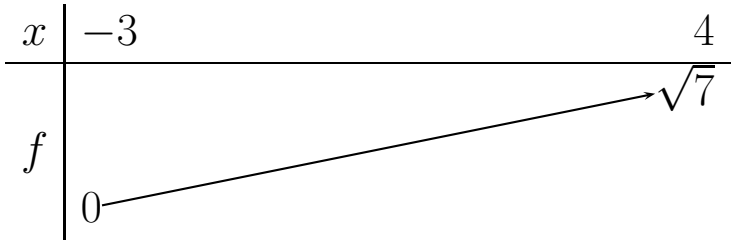
x	-4	-3	-2	-1	0	1	2	3	4
$f(x)$		0	1	$\sqrt{2}$	$\sqrt{3}$	2	$\sqrt{5}$	$\sqrt{6}$	$\sqrt{7}$

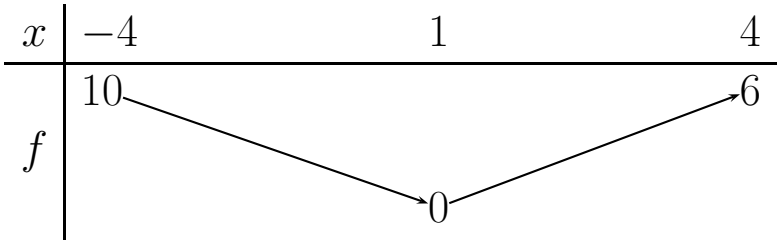
x	-4	-3	-2	-1	0	1	2	3	4
$f(x)$	10	8	6	4	2	0	2	4	6

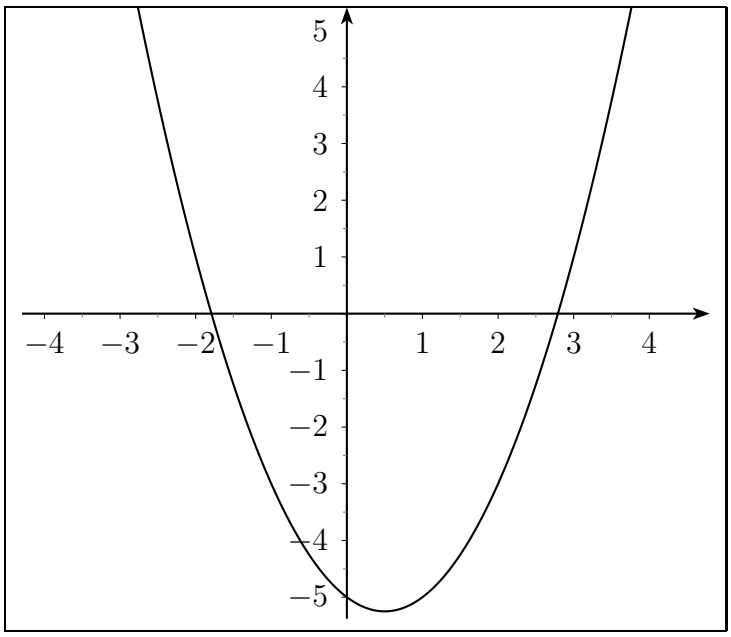

x
-4
$\frac{01}{2}$
4
f
15
7
$-\frac{21}{4}$

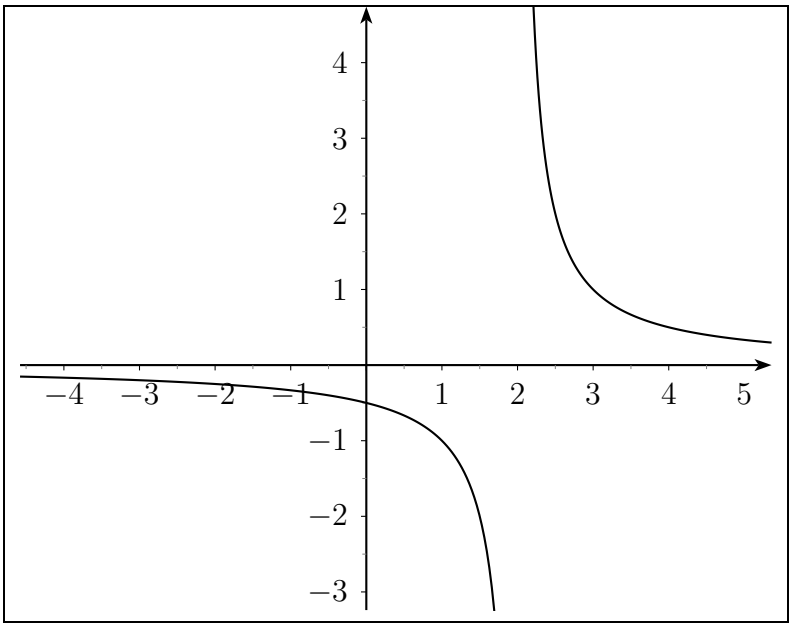

x
-4
2
4
f
$-\frac{01}{6}$
$-\infty$
$+\infty$
$\frac{01}{2}$


x
-4
$-\frac{2\sqrt{3}}{3}$
$\frac{2\sqrt{3}}{3}$
4
f
$\frac{4\sqrt{3}}{9}$
12
-12
$-\frac{4\sqrt{3}}{9}$


x
-3
4
f
$\sqrt{7}$
0


x
-4
1
4
f
10
6
0


5
4
3
2
1
−4
−3
−2
−1
1
2
3
4
−1
−2
−3
−4
−5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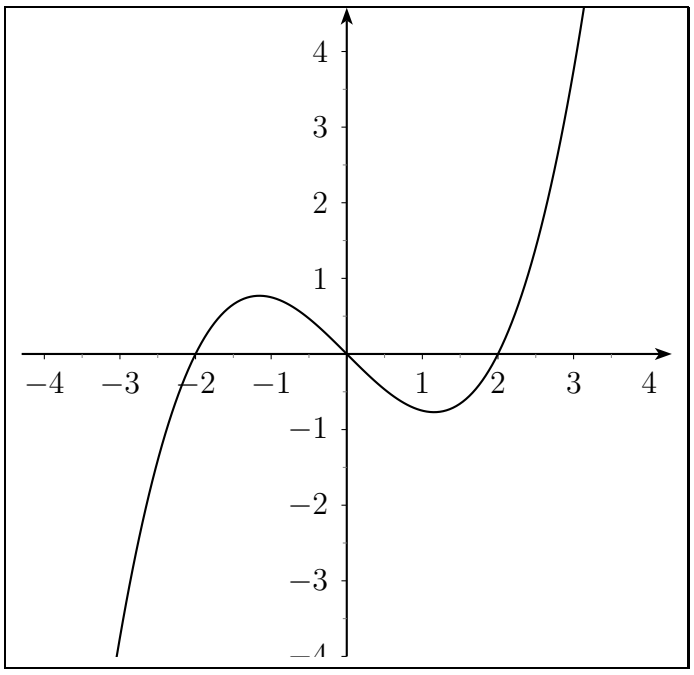
3
2
1
−4
−3
−2
−1
1
2
3
4
5
−1
−2
−3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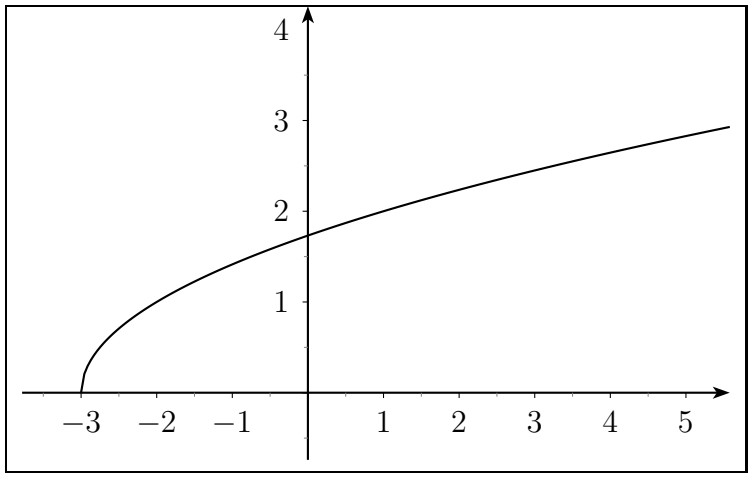
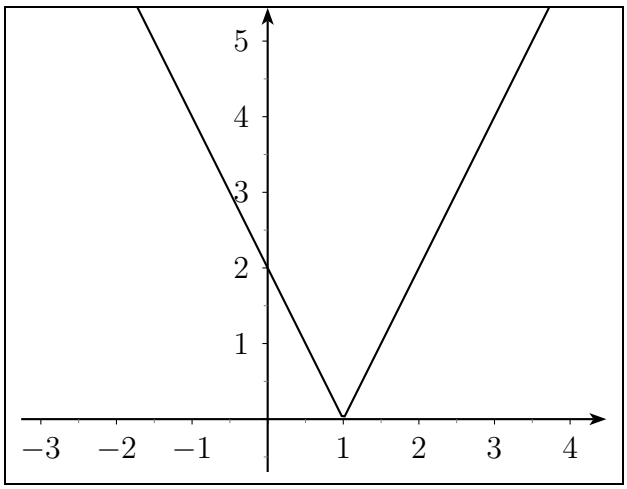
3
2
1
−4
−3
−2
−1
1
2
3
4
−1
−2
−3


4
3
2
1
−3
−2
−1
1
2
3
4
5


5
4
3
2
1
−3
−2
−1
1
2
3
4