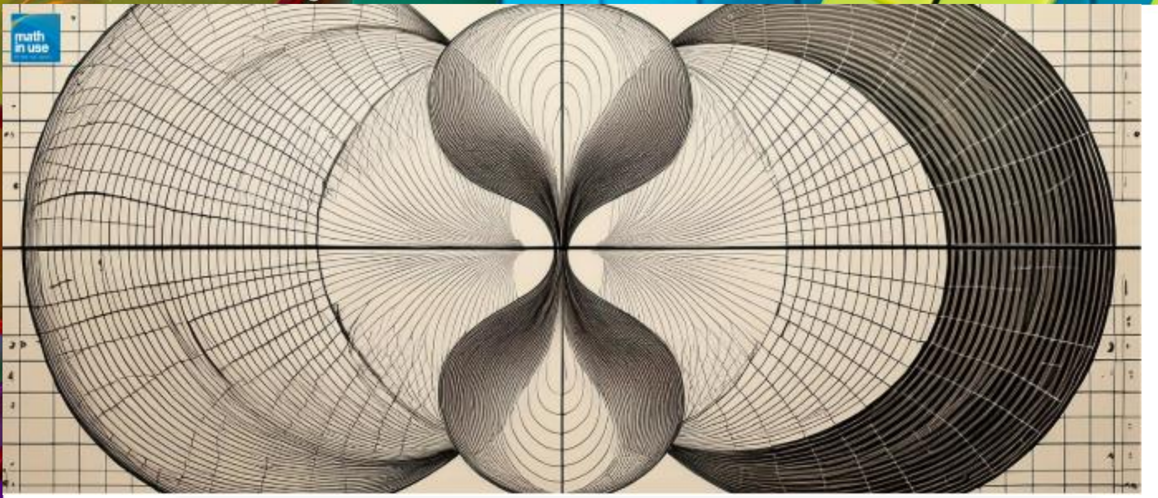
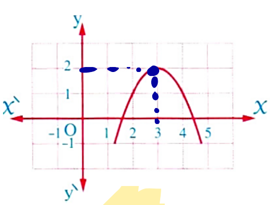


Geometrical transformation of basic function curves

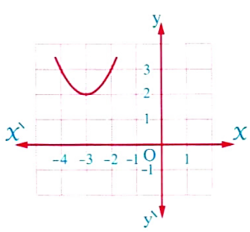
Choose the correct answer

If $f(X) = -(X-3)^2 + 2$, then the graph that represents the function f is ……………

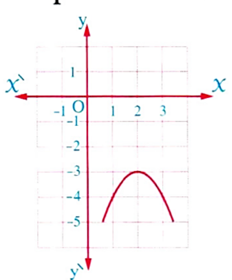
(3 , 2)



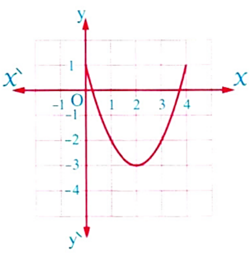
(a)



~~(b)~~



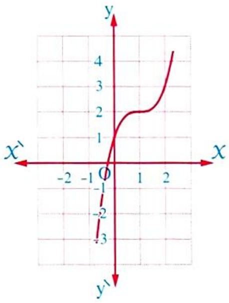
(c)



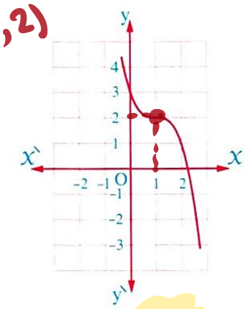
~~(d)~~

If $f(x) = 2 - (x - 1)^3$, then the graph that represents the function f is ……………

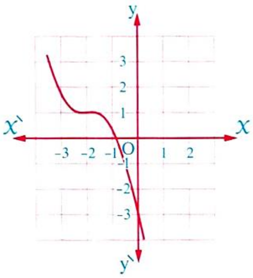
(1,2)



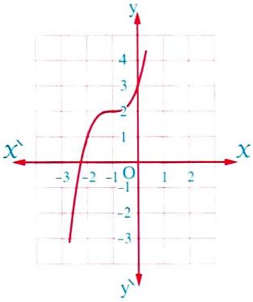
~~(a)~~



(b)



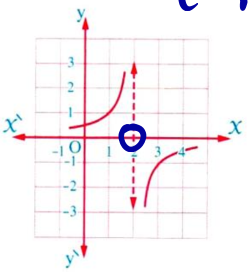
~~(c)~~



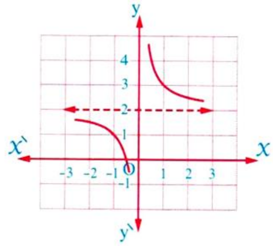
~~(d)~~

If $f(x) = \dfrac{1}{x-2}$, then the graph that represents the function f is ....

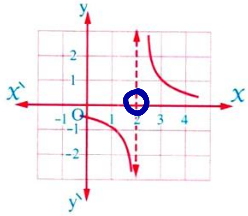
(2,0)



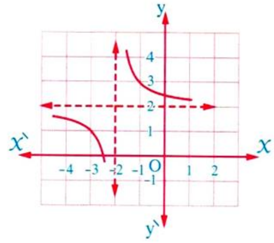
(a)



(b)



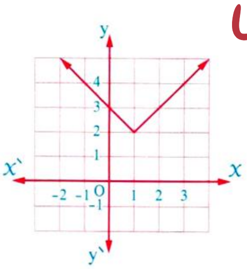
(c)



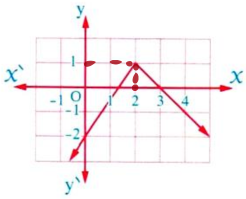
(d)

If $f : f(X) = 1 - |X - 2|$ then the figure which represents the function f is ....

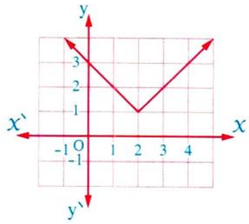
(2,1)



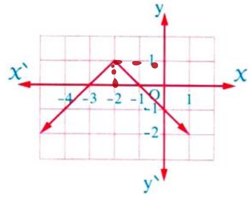
(a)



(b)



(c)

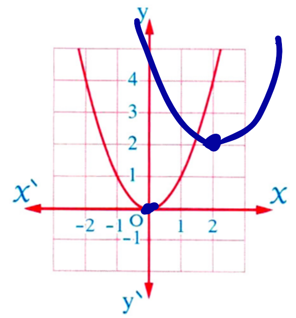


(d)

math in use
BY MICHAEL GAMIL

The curve of the function in the given figure is translated two units in the positive directions of the two axes then the function represents this translation is f : ....

(2,2)



(a) $f(X) = (X+2)^2 + 2$

(b) $f(X) = (X+2)^2 - 2$

(c) $f(X) = (X-2)^2 - 2$

(d) $f(X) = (X-2)^2 + 2$

$f(x) = (x-2)^2 + 2$

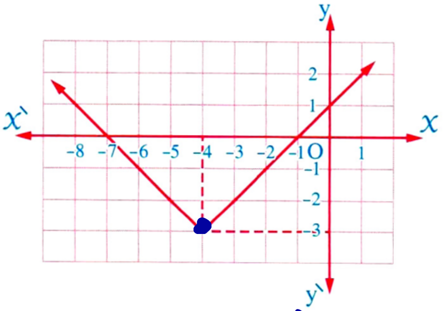
Which of the following function rules represents the curve in the given figure ?

(a) $f(X) = |X - 4| - 3$ $(4, -3)$

(b) $f(X) = |X - 4| + 3$ $(4, 3)$

(c) $f(X) = |X + 4| - 3$ $(-4, -3)$

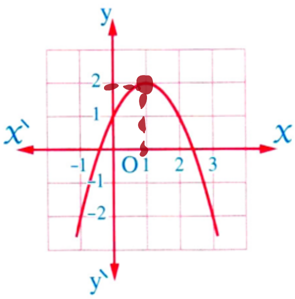
(d) $f(X) = |X + 4| + 3$ $(-4, 3)$



$(\underline{-4}, \underline{-3})$

$f(x) = |x+4| - 3$

Which of the following function rules is represented in the given figure ?



(a) $f(x) = (x-1)^2 + 2$

(b) $f(x) = 1 - (x-2)^2$ (2, 1)

(c) $f(x) = 2 - (x-1)^2$ (1, 2)

(d) $f(x) = (x+1)^2 - 2$

The point of the vertex of the curve of the function $f : f(X) = (2 - X)^2 + 3$ is ....

(a) $(2 , 3)$ (b) $(2 , - 3)$ (c) $(- 2 , 3)$ (d) $(- 2 , - 3)$

$f(x) = (x-2)^2 + 3$

$(2, 3)$

$(x-a)^2 = (a-x)^2$

math in use
BY MICHAEL GAMIL

The symmetric point of the function $f : f(x) = x^3 - 2$ is ....

(a) (0 , 2) (b) (0 , – 2) (c) (2 , 0) (d) (– 2 , 0)

(0 , −2)

The symmetric point of the function $f : f(X) = 3 - (X + 2)^2$ is ……………

(a) $(3, 2)$ (b) $(2, 3)$ (c) $(-2, 3)$ (d) $(-2, -3)$

$(-2, 3)$

The symmetric point of the function $f : f(X) = \frac{1}{X} + 2$ is ……………

(a) $(2\ ,0)$ (b) $(1\ ,2)$ (c) $(0\ ,2)$ (d) $(0\ ,0)$

$(0,2)$

The point of symmetry of the curve of the function $f : f(X) = \frac{1}{X-3} + 4$ is ....

(a) (3 , – 4) (b) (– 3 , – 4) (c) (3 , 4) (d) (– 3 , 4)

(3,4)

The symmetric point of the function $f : f(x) = \frac{x+1}{x}$ is ....

(a) (1 , 0) (b) (0 , 1) (c) (0 , 0) (d) (1 , – 1)

$f(x) = 1 + \frac{1}{x}$

$\frac{a+b}{c}$

$= \frac{a}{c} + \frac{b}{c}$

(0, 1)

math in use
BY MICHAEL GAMIL

If f is a function where $f(X) = \frac{1}{X}$, then the symmetric point of the function g : $g(X) = f(X + 1)$ is ……………

(a) (1 , 0) (b) (0 , 1) (c) (– 1 , 0) (d) (– 1 , 1)

$g(x) = \frac{1}{x+1}$

$(-1, 0)$

If $f(x) = \frac{a}{x - b} + c$ where a , b , c $\in \mathbb{R}$ has the symmetric point (3 , 3)
, then $a^{b+c} = \dots\dots\dots\dots$

(a) a^9 (b) 1 (c) a^6 (d) – 1

$(b, c) = (3, 3) \Rightarrow b = 3 \quad , \quad c = 3$

$a^{3+3} = a^6$

The vertex of the curve of the function $f : f(X) = |X + 3| - 2$ is ....

(a) $(3, 2)$ (b) $(-3, -2)$ (c) $(-3, 2)$ (d) $(3, -2)$

$(-3, -2)$

The curve of the function $f : f(x) = |x - 2|$ is symmetric about the straight line ....

(a) $x = 2$ (b) $x = -2$ (c) $y = 2$ (d) $y = -2$

$\overset{x}{(2}, \overset{y}{0})$

$x = 2$

The axis of symmetry of the function $f : f(x) = x^2 - 1$ is the straight line ....

(a) $x = 1$ (b) $x = 0$ (c) $y = 1$ (d) $y = 0$

$(0, -1)$

$x = 0$ → y-axis

math in use
BY MICHAEL GAMIL

If $f(x) = \frac{1}{|x|}$, then the equation of the axis of symmetry of the curve of the function f is ....

(a) $y = 0$ (b) $x = 0$ (c) $y = x$ (d) $y = -x$

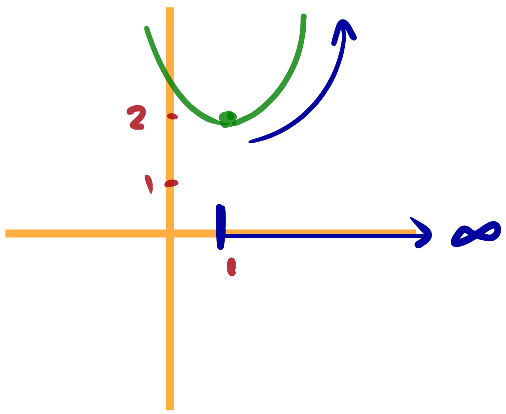
$(0,0)$

$x=0$

The function $f : f(x) = (x-1)^2 + 2$ is increasing on the interval .... $]1, \infty[$

(a) $\mathbb{R}$ (b) $]1, \infty[$ (c) $]-\infty, 1[$ (d) $]-1, 1[$

$(1, 2)$



The function f where $f(x) = \frac{2x-1}{x-1}$ is decreasing on the interval ....

(a) $]-\infty , 1]$

(b) $]-\infty , 1[\, ,]1 , \infty[$

(c) $[1 , \infty[$

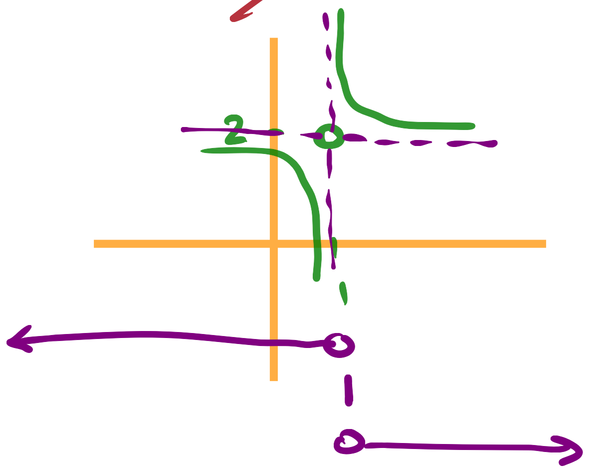
(d) $]-\infty , 2[\, ,]2 , \infty[$

$$f(x) = \frac{2x-1-1+1}{x-1}$$

$$f(x) = \frac{(2x-2)+1}{x-1} = \frac{2\cancel{(x-1)}}{\cancel{x-1}} + \frac{1}{x-1}$$

$$f(x) = 2 + \frac{1}{x-1}$$

$(1, 2)$

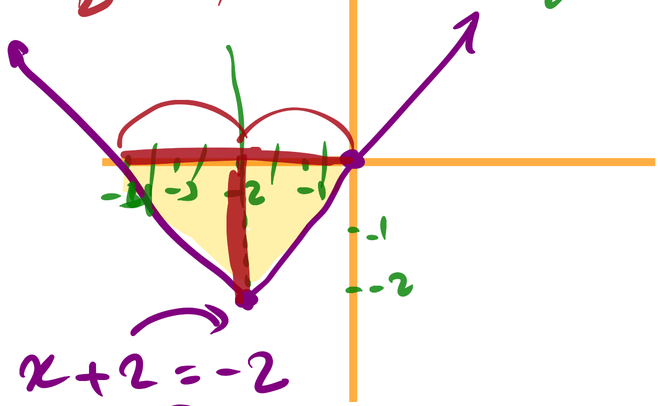


The area between the curve of the function $f : f(x) = |x + 2| - 2$ and the x-axis equals .... square units.

(a) 3 (b) 2 (c) 5 (d) 4

$\frac{1}{2} \times 4 \times \cancel{2} = 4$ S.u.

$(-2, -2)$



$|x + 2| - 2 = 0$

$|x + 2| = 2$

$x + 2 = 2$

$\boxed{x = 0}$

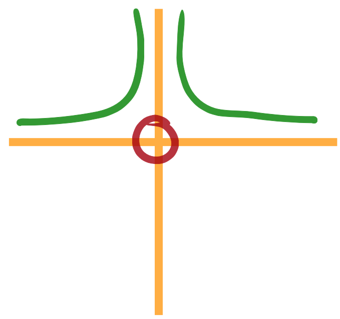
$x + 2 = -2$

$x = -4$

The range of the function $f : f(x) = \frac{1}{|x|}$ is .... $D = \mathbb{R} - \{0\}$

(a) $\mathbb{R} - \{0\}$ (b) $]0, \infty[$ (c) $[0, \infty[$ (d) $\{0\}$

$$f(x) = \begin{cases} \frac{1}{x} & x > 0 \\ -\frac{1}{x} & x < 0 \end{cases}$$

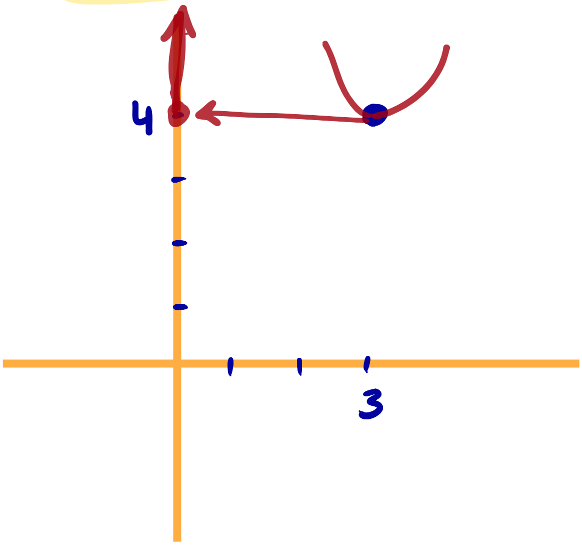


range $=]0, \infty[$

The range of the function f where $f(x) = (x-3)^2 + 4$ is ....

(a) $]-\infty , 3[$ (b) $[-3 , 4]$ (c) $[4 , \infty[$ (d) $]-\infty , 4]$

$(3,4)$

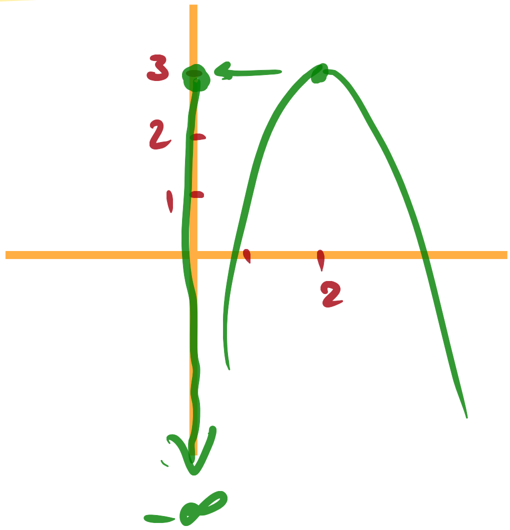


The range of the function $f : f(x) = 3 - (2 - x)^2$ is ……………

(a) $]-\infty , 2]$ (b) $[2 , \infty[$ (c) $]-\infty , 3]$ (d) $[3 , \infty[$

$f(x) = 3 - (x-2)^2$

$(2, 3)$



The range of the function $f : f(x) = \frac{2x^2 - 2x}{x - 1}$ equals ....

(a) $\mathbb{R} - \{1\}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{1, 2\}$ (d) $\mathbb{R} - \{0, 1\}$

$f(x) = \frac{2x\cancel{(x-1)}}{\cancel{x-1}}$

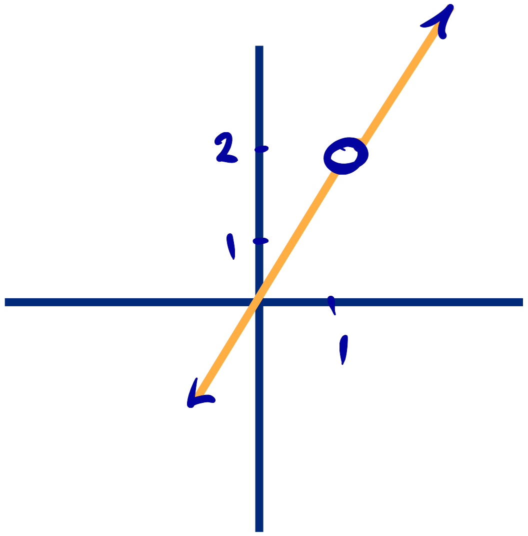
$D = \mathbb{R} - \{1\}$

$f(x) = 2x$

$f(1) = 2(1) = 2$

$(1, 2)$

range $= \mathbb{R} - \{2\}$



The range of the function $f : f(X) = 2 - \frac{3}{X - 1}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{1\}$ (c) $\mathbb{R} - \{2\}$ (d) $\mathbb{R} - \{3\}$

$(1, 2)$

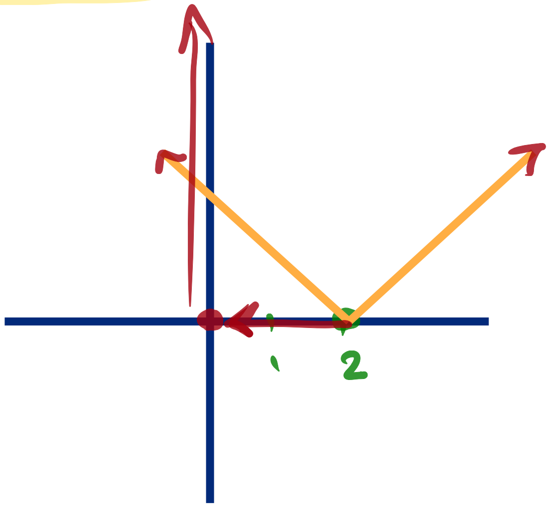
domain $= \mathbb{R} - \{1\}$

range $= \mathbb{R} - \{2\}$

The range of the function $f : f(x) = |x - 2|$ is ....

(a) $]0 , \infty[$ (b) $[2 , \infty[$ (c) $[0 , \infty[$ (d) $]2 , \infty[$

$(2, 0)$

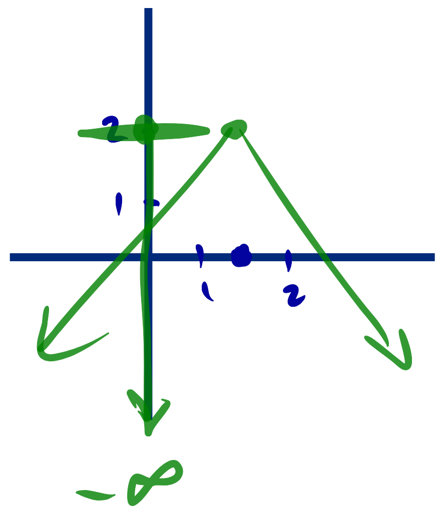


The range of the function $f : f(x) = 2 - |3 - 2x|$ is ……………

(a) $]-\infty , 2]$ (b) $[-2 , \infty[$ (c) $]\frac{3}{2} , \infty[$ (d) $]-\infty , -2]$

$f(x) = 2 - |\underline{\underline{2}}x - \underline{\underline{3}}|$

$\left(\frac{3}{2} , 2\right)$

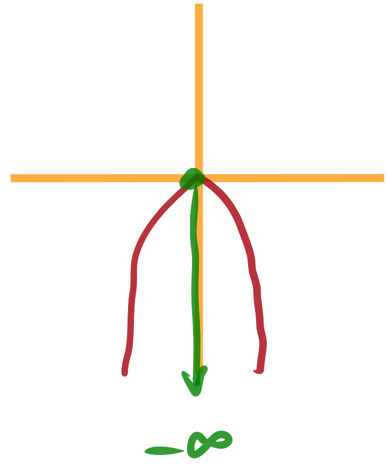


Mr. Michael Gamil 0122 73 75 987

The range of the function f where $f(x) = -|x^3|$ is ....

(a) $\mathbb{R}$ (b) $[0, \infty[$ (c) $]-\infty, 0]$ (d) $\mathbb{R} - \{0\}$

$$f(x) = \begin{cases} -x^3 & x \geq 0 \\ x^3 & x < 0 \end{cases}$$

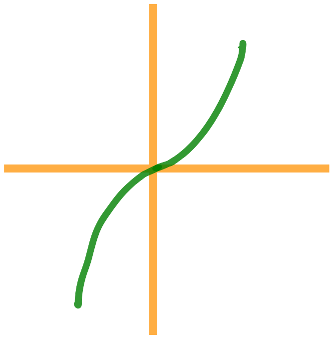


The range of the function $f : f(x) = x\,|x|$ is ....

(a) $\mathbb{R}^+$ (b) $\mathbb{R}^-$ (c) $\mathbb{R}$ (d) $[0 , \infty[$

$$f(x) = \begin{cases} x(x) & x \geq 0 \\ x(-x) & x < 0 \end{cases}$$

$$f(x) = \begin{cases} x^2 & x \geq 0 \\ -x^2 & x < 0 \end{cases}$$

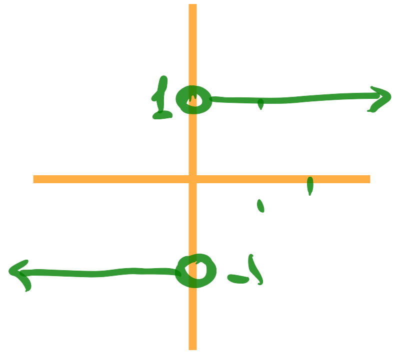


The range of the function $f : f(x) = \frac{|x|}{x}$ is ....

(a) $]0 , \infty[$ (b) $]-\infty , 0[$ (c) $\mathbb{R} - \{0\}$ (d) $\{1 , -1\}$

$$f(x) = \begin{cases} \frac{x}{x} & x > 0 \\ \frac{-x}{x} & x < 0 \end{cases}$$

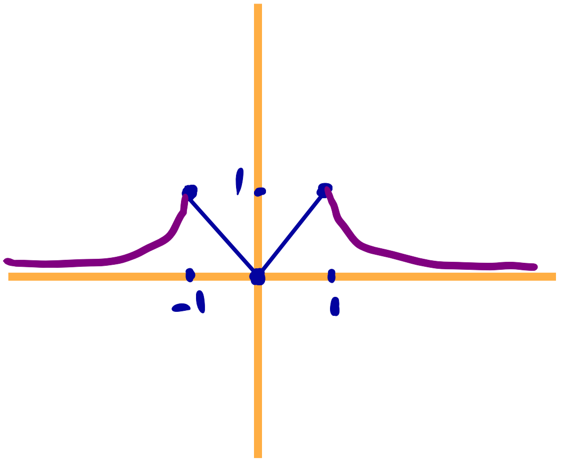
$$= \begin{cases} 1 & x > 0 \\ -1 & x < 0 \end{cases}$$



The range of the function $f : f(x) = \begin{cases} -\frac{1}{x} & , x < -1 \\ |x| & , -1 \le x \le 1 \\ \frac{1}{x} & , x > 1 \end{cases}$.

(a) $]0 , 1]$ (b) $[0 , 1]$ (c) $]0 , \infty[$ (d) $\mathbb{R} - \{0\}$

$[0 , 1]$



The range of the function $f : f(x) = \begin{cases} x - 1 & , \quad x < 1 \\ 3 & , \quad x > 1 \end{cases}$ is ……………

$D = \mathbb{R} - \{1\}$

(a) $\mathbb{R} - [0 , 1]$

(b) $\mathbb{R} - \{1\}$

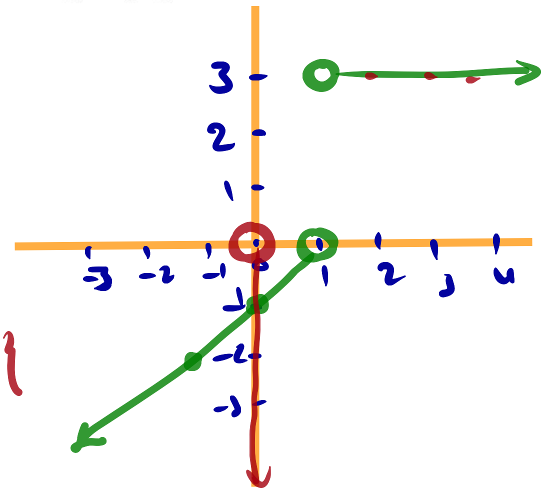
(c) $]-\infty , 0[\cup \{3\}$

(d) $]-\infty , 0[\cap \{3\}$

$f(x) = x - 1$ ↗

x	1	0	-1	-2
y	0	-1	-2	-3

range $=]-\infty, 0[\cup \{3\}$



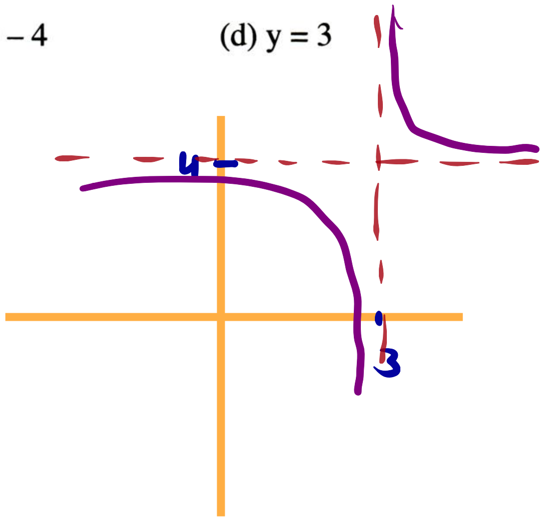
The curve of the function $f : f(x) = \frac{1}{x-3} + 4$ does not intersect the straigh line whose equation is ....

(a) $x = -3$ (b) $x = 3$ (c) $y = -4$ (d) $y = 3$

(3,4)

x = 3

y = 4



math in use
BY MICHAEL GAMIL

If $y = f(x)$ is a real function , then its image by translation 3 units vertically upwards is $g(x) = \ldots\ldots\ldots\ldots$

(a) $f(x-3)$ (b) $f(x+3)$ (c) $f(x)+3$ (d) $(x)-3$

$g(x) = f(x) + 3$

If the curve y = f (x) represents a real function then its image by translation 5 units vertically downward is the same as g (x) = ……………

(a) $f(x-5)$ (b) $f(x+5)$ (c) $f(x)+5$ (d) $f(x)-5$

$g(x) = f(x) - 5$

The curve of the function g : g $(x) = x^2 + 4$ is the same curve of the function $f : f(x) = x^2$ by a translation of magnitude 4 units in the direction of ....

(a) $\overrightarrow{Ox}$ (b) $\overrightarrow{Ox'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

(0, 4)

$(0, -2)$

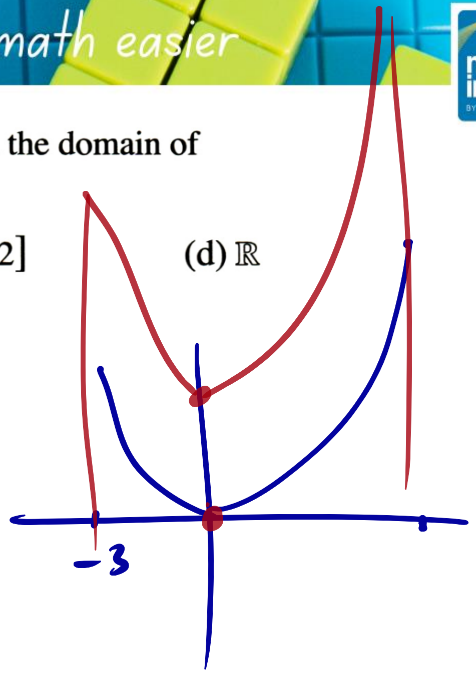
The curve of the function g where $g(x) = |x| - 2$ is the same as the curve of the function $f : f(x) = |x|$ by translation two units in direction of ....

(a) $\overrightarrow{Ox}$ (b) $\overrightarrow{Ox'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

If f is a real function whose domain is $[-3, 4]$, then the domain of $g : g(x) = f(x) + 2$ is ....

(a) $[-3, 4]$ (b) $[-1, 6]$ (c) $[-5, 2]$ (d) $\mathbb{R}$

$g(x) = f(x) + 2$



math in use
BY MICHAEL GAMIL

(0,2)

The curve of the function g : g $(x) = \frac{1}{|x|} + 2$ is the same as the curve of the function $f : f(x) = \frac{1}{|x|}$ by translation two units in direction of ....

(a) $\overrightarrow{Ox}$ (0,0) (b) $\overrightarrow{Ox'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

math in use BY MICHAEL GAMIL

$(-3, 0)$

The curve of the function g : g $(x) = |x + 3|$ is the same curve of the function $f : f(x) = |x|$ by a translation of magnitude 3 units in the direction of ....

$(0, 0)$

(a) $\overrightarrow{Ox}$ (b) $\overleftarrow{Ox}$ (c) $\overrightarrow{Oy}$ (d) $\overleftarrow{Oy}$

$(0,0) \Rightarrow (-4,0)$

If y = $f(x)$ is a real function , then its image by translation 4 units to the left is g (x) = ...

(a) $f(x-4)$ (b) $f(x+4)$ (c) $f(x)+4$ (d) $f(x)-4$

in

$g(x) = f(x+4)$

If f is a real function whose domain is $[-2 , 3]$, then the domain of $g : g(x) = f(x-2)$ is ....

(a) $[-2 , 3]$ (b) $[-4 , 1]$ (c) $[0 , 5]$ (d) $\mathbb{R}$

Right $\boxed{2}$

$g(x) = f(x-2)$

$[-2 , 3] \longrightarrow [0 , 5]$

$\boxed{+2}$ $\boxed{2}$

Lef $f(x) = -x^2$ move 3 units to the right and 2 units down , then resulted curve is $g(x)$, then $g(4) =$ ....

(a) – 3 (b) – 16 (c) 16 (d) – 7

$f(x) = -x^2$ $(0,0)$ $\cap$

$g(x) = -(x-3)^2 - 2$ $(3,-2)$ $\cap$

$g(4) = -(4-3)^2 - 2 = -1 - 2 = -3$

If the curve $f(x) = -x^3$ moves 4 units to the left and 2 units upwards to become the curve $g(x)$, then $g(-2) =$ ……………

(a) – 218 (b) 214 (c) 6 (d) – 6

$f(x) = -x^3$

2

4

$(0, 0)$

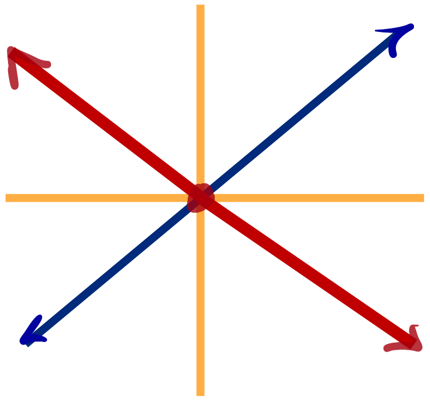
$g(x) = -(x+4)^3 + 2$ $(-4, 2)$

$g(-2) = -(-2+4)^3 + 2 = -8 + 2 = -6$

math in use
BY MICHAEL GAMIL

The curve of the function g : g $(x) = x$ is the same as the curve of the function $f : f(x) =$ .... by reflection in the x-axis.

(a) x (b) $-x$ (c) $x + 1$ (d) $-x + 1$



The product of the slopes of the two straight lines $f(x) = a\,x + b$ and its image by reflection in x-axis equals .... $a \times -a = -a^2$

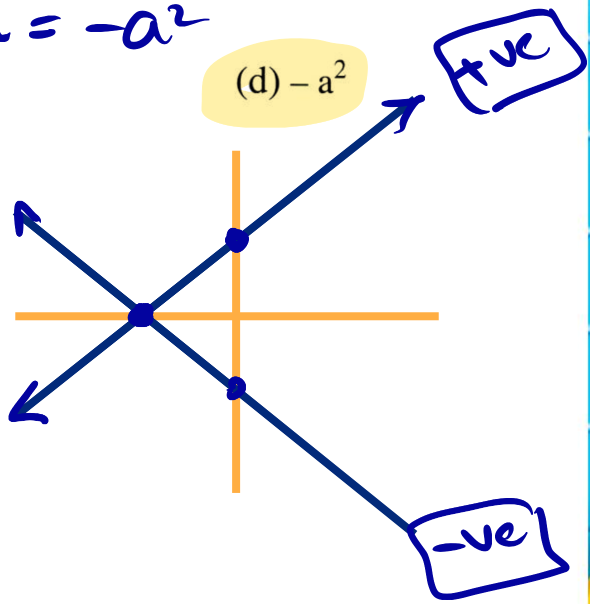
(a) 1 (b) – 1 (c) a (d) – a^2

$f(x) = ax + b$

Slope $= a$

$g(x) = -ax - b$

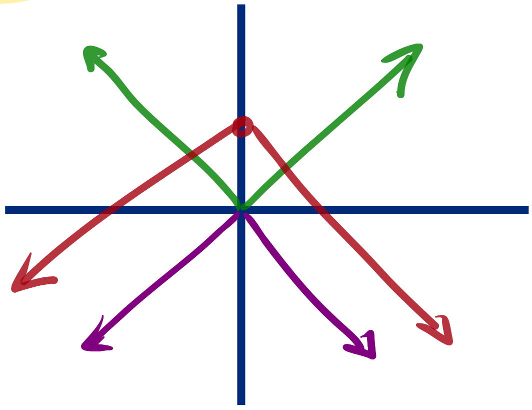
Slope $= -a$

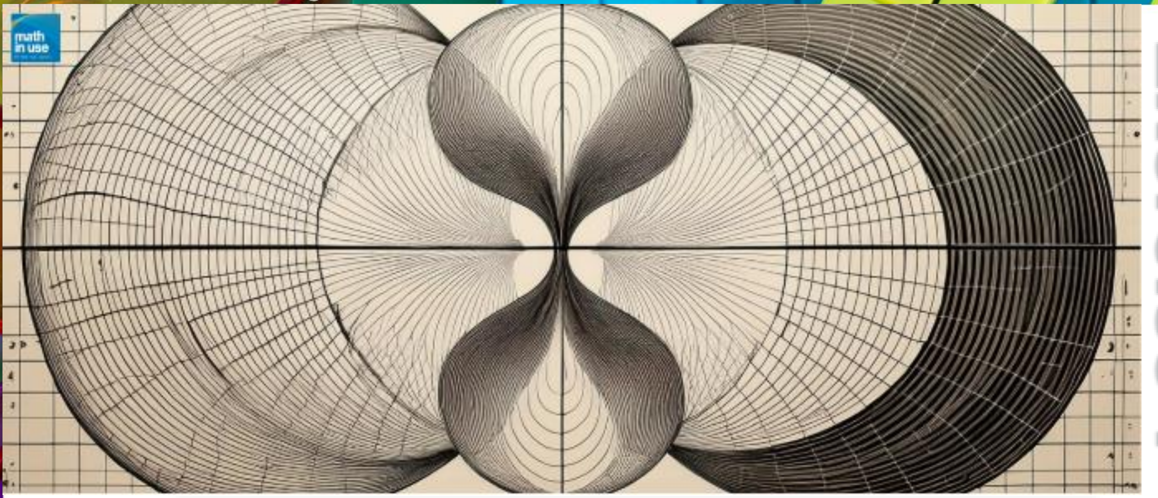


The curve of the function g : g (x) = 1 – | x | is the same curve of the function f : f (x) = | x | by reflection in x-axis , then a translation of magnitude one unit in the direction of ....

(a) $\overrightarrow{Ox}$ (b) $\overrightarrow{Ox'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

(0,0) (0,1)





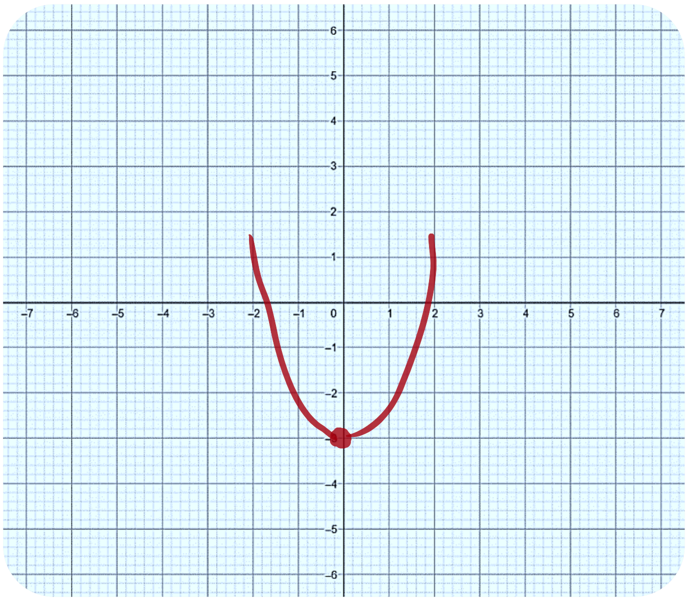
Exercise 7

Geometrical transformation of basic function curves

Answer each of the following questions

(1) Use the curve of the function f where $f(X) = X^2$ to represent each of the functions that are defined by the following rules , from the graph find the domain and the range of the function and discuss its monotonicity and its type whether it is even , odd or otherwise and write its axis of symmetry :

[1] $g(X) = X^2 - 3$



$(0, -3)$

$D = \mathbb{R}$

range: $[-3, \infty[$

Type even

mono. dec. $]-\infty, 0[$

inc. $]0, \infty[$

axis of sym. $\boxed{X = 0}$

Not one-to-one

(1) Use the curve of the function f where $f(x) = x^2$ to represent each of the functions that are defined by the following rules , from the graph find the domain and the range of the function and discuss its monotonicity and its type whether it is even , odd or otherwise and write its axis of symmetry :

[2] $g(x) = -(x-3)^2$

(3,0) ∩

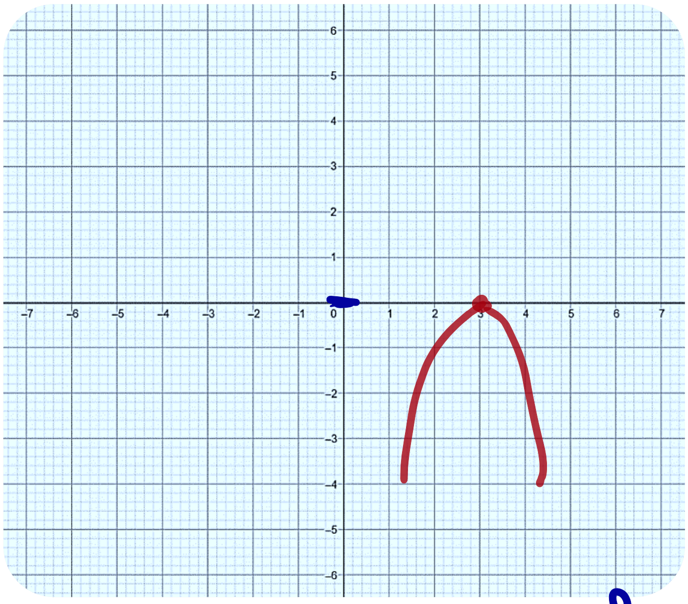
domain = $\mathbb{R}$

range : $]-\infty, 0]$

Type = N./N.

mono. inc

dec. $]-\infty, 3[$
inc. $]3, \infty[$

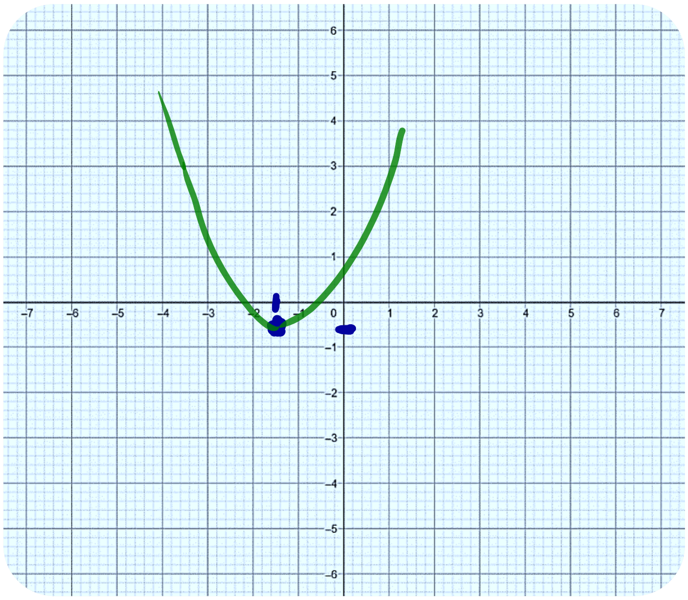


equation axis of sym. = $\boxed{x=3}$

Not one-to-one

① Use the curve of the function f where $f(x) = x^2$ to represent each of the functions that are defined by the following rules , from the graph find the domain and the range of the function and discuss its monotonicity and its type whether it is even , odd or otherwise and write its axis of symmetry :

3 $g(x) = \left(x + \frac{3}{2}\right)^2 - \frac{1}{2}$



$\left(-\frac{3}{2}, -\frac{1}{2}\right)$

domain = $\mathbb{R}$

range = $\left[-\frac{1}{2}, \infty\right[$

Type = N.IN.

mono. dec. $\left]-\infty, -\frac{3}{2}\right[$

inc. $\left]-\frac{3}{2}, \infty\right[$

equ. of axis of sym. $\boxed{x = -\frac{3}{2}}$

Not one-to-one

① Use the curve of the function f where $f(X) = X^2$ to represent each of the functions that are defined by the following rules , from the graph find the domain and the range of the function and discuss its monotonicity and its type whether it is even , odd or otherwise and write its axis of symmetry :

4 $g(X) = X^2 + 4X + 4$

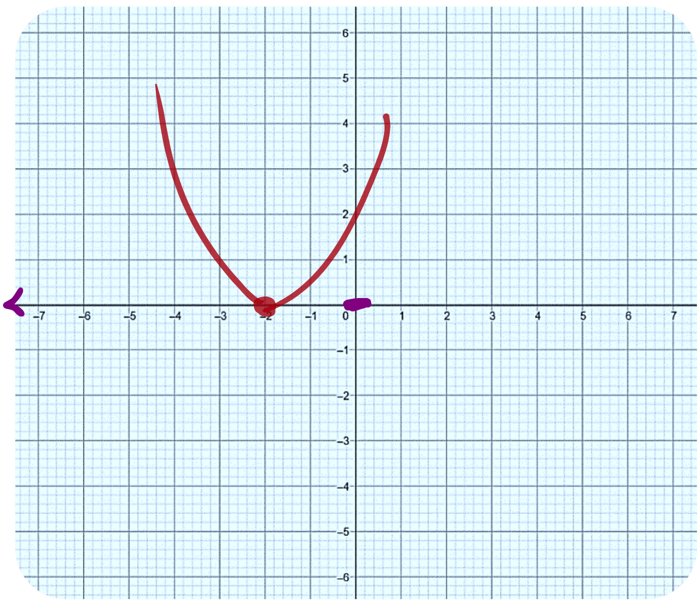
$g(x) = (x+2)^2$

$(-2, 0)$

$x = \frac{-b}{2a} = \frac{-4}{2(1)} = -2$

$y = f(-2) = 0$

$(-2, 0)$



$D = \mathbb{R}$ Range $= [0, \infty[$

Type N.(N. Not one-to-one

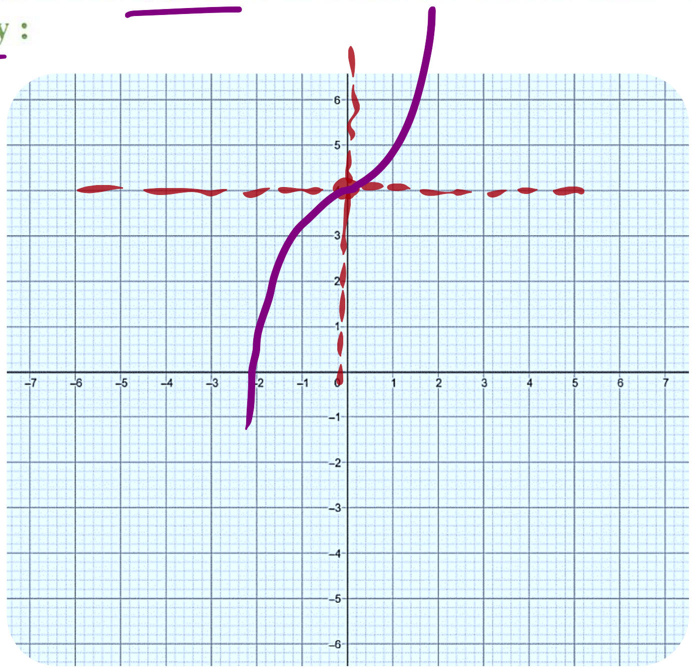
mono. dec. $]-\infty, -2[$

inc $]-2, \infty[$

equation of axis of sym $\boxed{x = -2}$

② Use the curve of the function f where $f(X) = X^3$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range , discuss its monotonicitly and its type whether it is even , odd or otherwise and write its point of symmetry :

1 $g(X) = X^3 + 4$



$(0, 4)$

domain = $\mathbb{R}$

range = $\mathbb{R}$

Type N./N.

one-to-one

mono. inc. on $]-\infty, 0[$, $]0, \infty[$

(2) Use the curve of the function f where $f(X) = X^3$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range , discuss its monotonicitly and its type whether it is even , odd or otherwise and write its point of symmetry :

2 $g(X) = (2 - X)^3$

$g(x) = -(x-2)^3$

$(2,0)$

$D = \mathbb{R}$ range $= \mathbb{R}$

Type. = N./N.

one-to-one

mono dec. $]-\infty, 2[$, $]2, \infty[$

② Use the curve of the function f where $f(X) = X^3$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range , discuss its monotonicitly and its type whether it is even , odd or otherwise and write its point of symmetry :

3 $g(X) = 2 - (X - 1)^3$

(1, 2)

D=R range=R

Type N.I N

One-to-one

Mono. dec.]-∞, 1[,]1, ∞[

② Use the curve of the function f where $f(x) = x^3$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range , discuss its monotonicitly and its type whether it is even , odd or otherwise and write its point of symmetry :

4 $g(x) = 2 - (x-1)^3$

$(1,2)$

$D = \mathbb{R}$ Range $= \mathbb{R}$

Type N.IN.

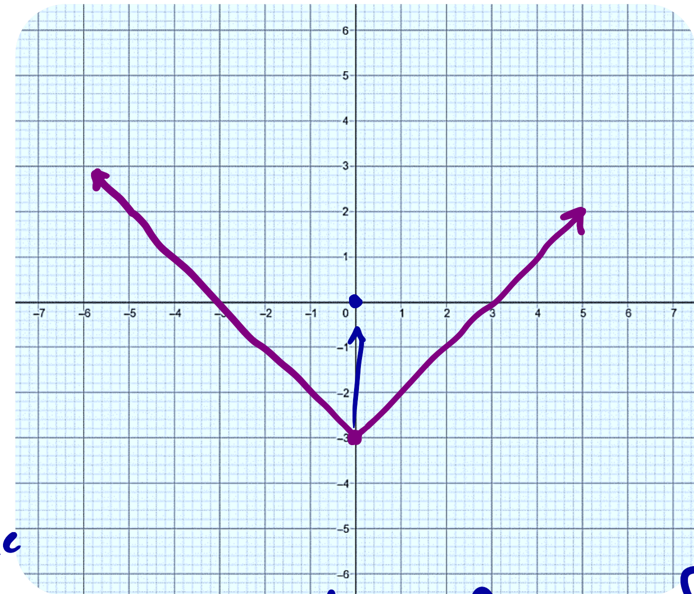
one_to_one

mono. dec. $]-\infty, 1[$, $]1, \infty[$

③ Use the curve of the function f where $f(x) = |x|$ to represent each of the functions that are defined by the following rules and from the graph determine its domain, range and discuss its monotonicity and its type whether it is even, odd or otherwise and write the equation of its axis of symmetry if exist :

1 $g(x) = |x| - 3$

$(0, -3)$



$D = \mathbb{R}$

range $[-3, \infty[$

Type = even

Not-one-to-one

Mono. dec $]-\infty, 0[$

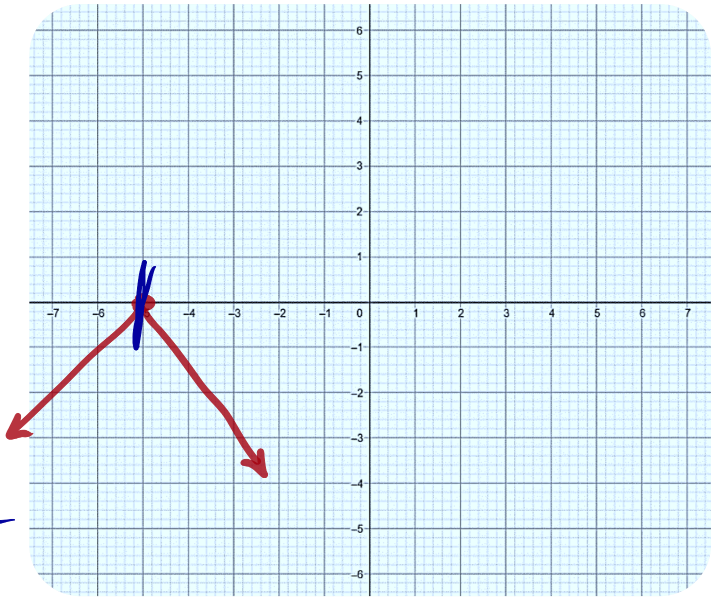
inc $]0, \infty[$

equation of axis of sym. $\boxed{x = 0}$

(3) Use the curve of the function f where $f(X) = |X|$ to represent each of the functions that are defined by the following rules and from the graph determine its domain , range and discuss its monotonicity and its type whether it is even , odd or otherwise and write the equation of its axis of symmetry if exist :

2 $g(X) = -|X+5|$

$(-5, 0)$



$D = \mathbb{R}$

range $]-\infty, 0]$

Type N/N.

not one-to-one

mono. inc. $]-\infty, -5[$

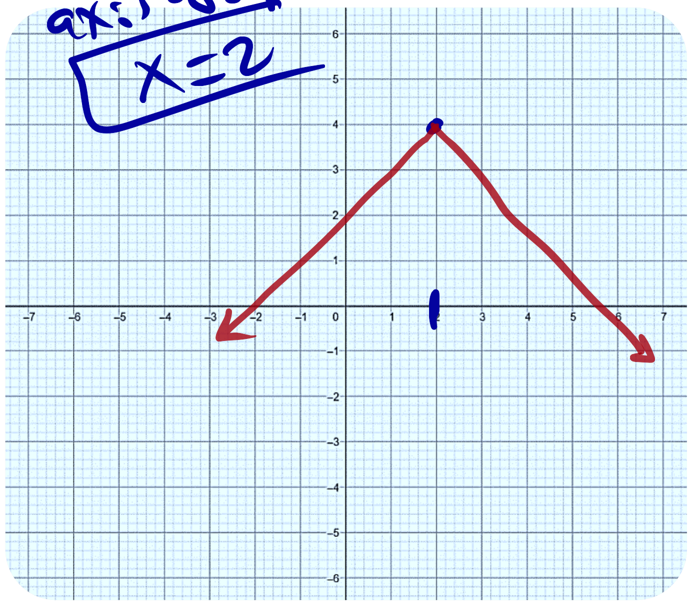
dec $]-5, \infty[$

equation of axis of sym. $\boxed{X = -5}$

③ Use the curve of the function f where $f(x) = |x|$ to represent each of the functions that are defined by the following rules and from the graph determine its domain , range and discuss its monotonicity and its type whether it is even , odd or otherwise and write the equation of its axis of symmetry if exist :

3 $g(x) = 4 - |x - 2|$

axis of sym.
$\boxed{x = 2}$



(2, 4)

domain = $\mathbb{R}$

range = $]-\infty, 4]$

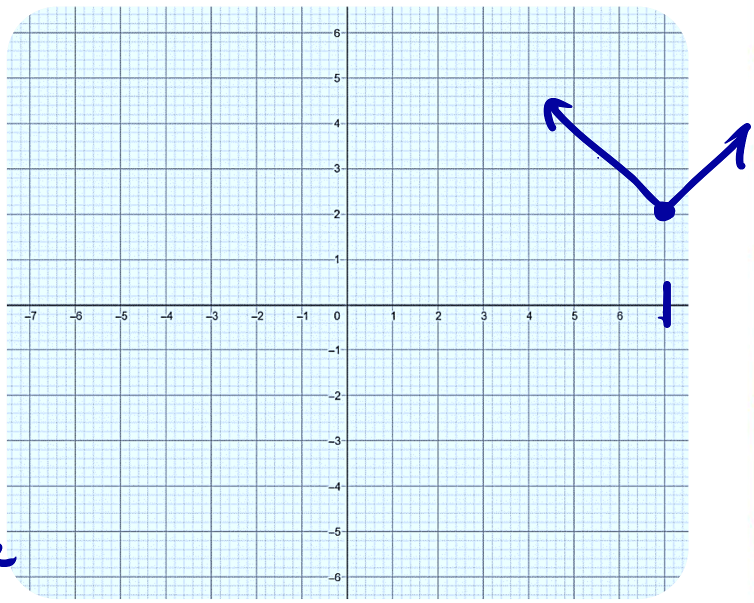
Type N.I.N.

Not one-to-one

mono. : inc. $]-\infty, 2[$
dec. $]2, \infty[$

③ Use the curve of the function f where $f(X) = |X|$ to represent each of the functions that are defined by the following rules and from the graph determine its domain , range and discuss its monotonicity and its type whether it is even , odd or otherwise and write the equation of its axis of symmetry if exist :

4 $g(X) = 2|X - 7| + 2$



(7, 2)

D = R

range: [2, ∞[

Type = N. / N.

Not one-to-one

axis of sym. = $\boxed{x = 7}$

mono. dec.]-∞, 7[

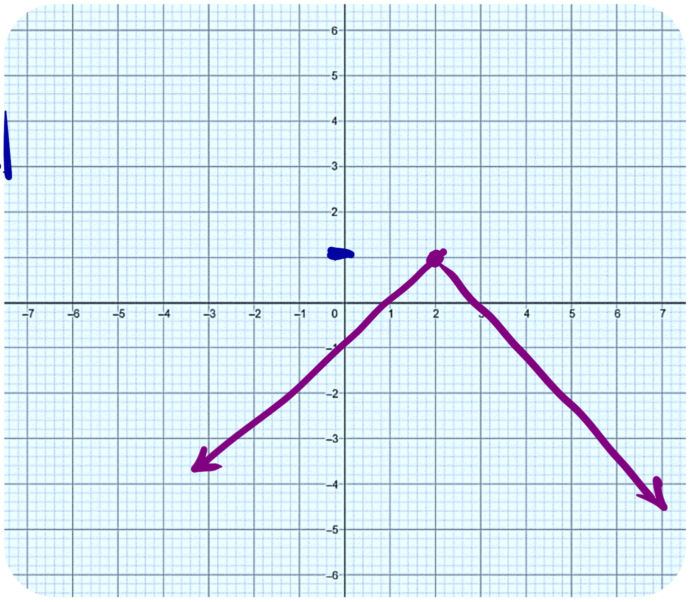
inc.]7, ∞[

math in use BY MICHAEL GAMIL

(3) Use the curve of the function f where $f(x) = |x|$ to represent each of the functions that are defined by the following rules and from the graph determine its domain, range and discuss its monotonicity and its type whether it is even, odd or otherwise and write the equation of its axis of symmetry if exist :

5 $g(x) = 1 - |\frac{1}{2}x - 1|$

$g(x) = 1 - \frac{1}{2}|x-2|$



(2, 1)

D = $\mathbb{R}$

range = $]-\infty, 1]$

Type = N./N.

Not one-to-one

equation $\boxed{x = 2}$

mono. inc. $]-\infty, 2[$

dec. $]2, \infty[$

math in use BY MICHAEL GAMIL

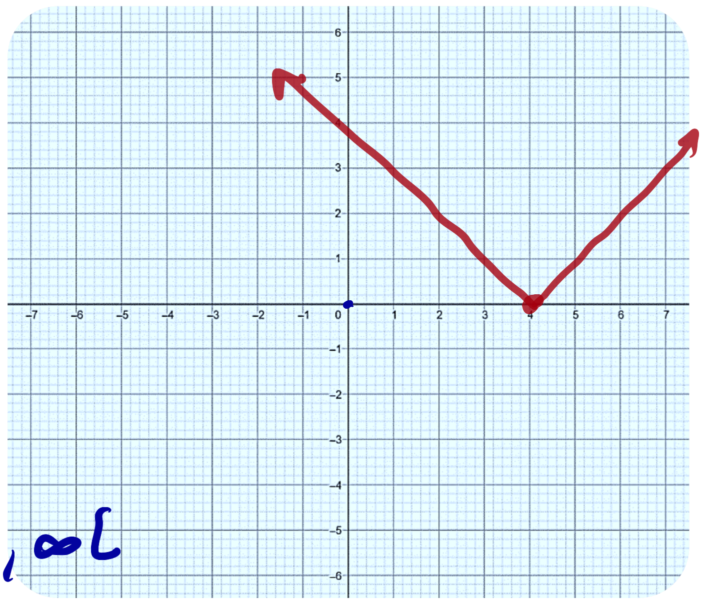
③ Use the curve of the function f where $f(x) = |x|$ to represent each of the functions that are defined by the following rules and from the graph determine its domain, range and discuss its monotonicity and its type whether it is even, odd or otherwise and write the equation of its axis of symmetry if exist :

6 $g(x) = \sqrt{x^2 - 8x + 16}$

$g(x) = \sqrt{(x-4)^2}$

$g(x) = |x-4|$

$(4, 0)$



$D = \mathbb{R}$ range $= [0, \infty[$

Type: N./N. not one-to-one

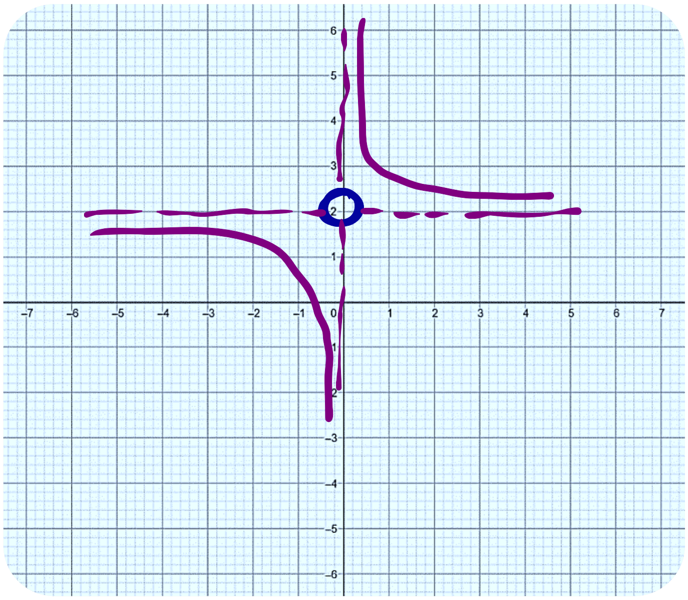
Mono. dec. $]-\infty, 4[$
inc. $]4, \infty[$

equation of axis of Sym. $\boxed{x=4}$

math in use
BY MICHAEL GAMIL

⑤ Use the curve of the function f where $f(x) = \frac{1}{x}$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range and discuss its monotonicity and its type whether it is even , odd or otherwise and write its point of symmetry :

[1] $g(x) = \frac{1}{x} + 2$



(0,2)

D = R − {0}

range = R − {2}

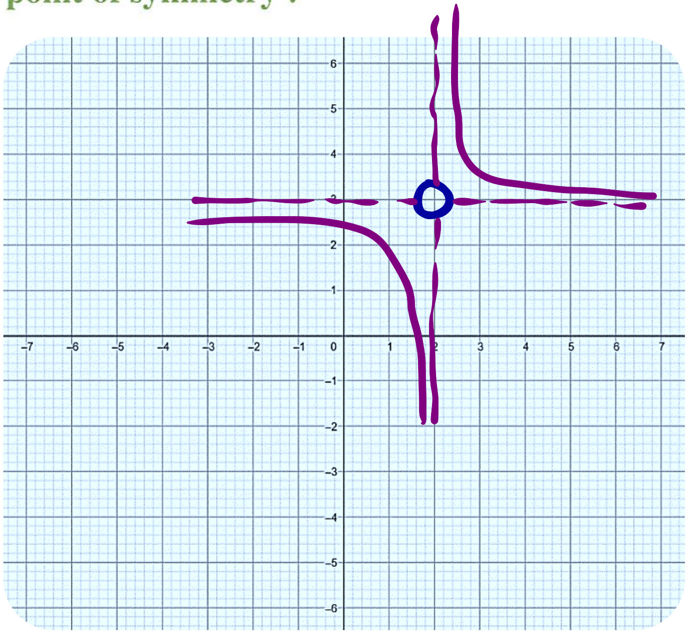
Type = N./N.

one – to – one

mono.]−∞,0[,]0,∞[

⑤ Use the curve of the function f where $f(X) = \frac{1}{X}$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range and discuss its monotonicity and its type whether it is even , odd or otherwise and write its point of symmetry :

2 $g(X) = \frac{1}{X-2} + 3$



(2,3)

D = R − {2}

range = R − {3}

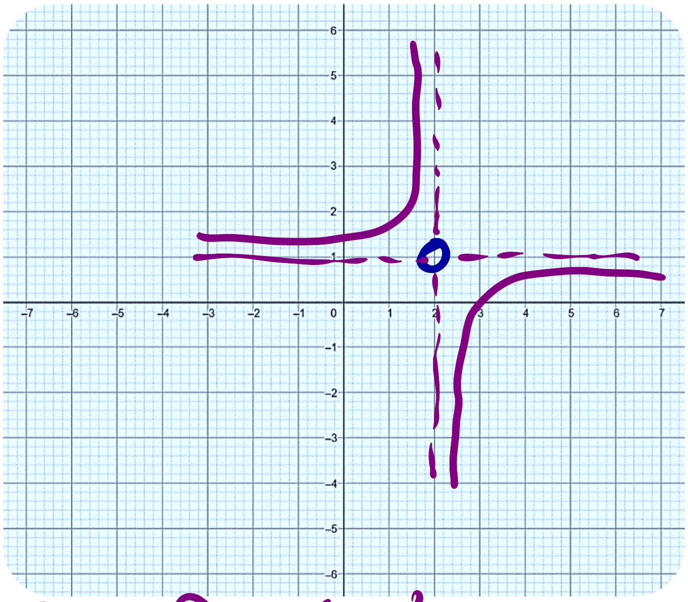
Type = N./N.

one − to − one

mono. dec.]−∞, 2[,]2, ∞[

(5) Use the curve of the function f where $f(x) = \frac{1}{x}$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range and discuss its monotonicity and its type whether it is even , odd or otherwise and write its point of symmetry :

[3] $g(x) = \frac{x-3}{x-2}$



$g(x) = \frac{x-2-1}{x-2}$

$= \frac{x-2}{x-2} - \frac{1}{x-2}$

$g(x) = 1 - \frac{1}{x-2}$

$(2, 1)$

$D = \mathbb{R} - \{2\}$

range $= \mathbb{R} - \{1\}$

Type: N.\ N.

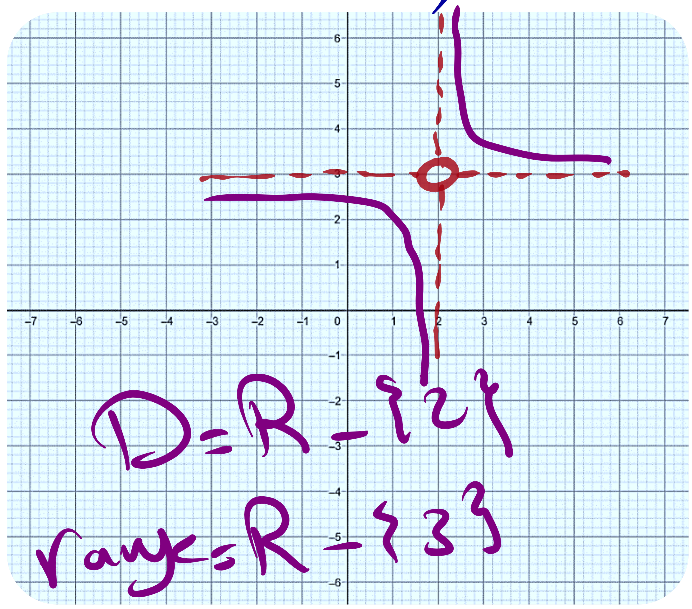
one-to-one

inc. $]-\infty, 2[$, $]2, \infty[$

(5) Use the curve of the function f where $f(x) = \frac{1}{x}$ to represent each of the functions that are defined by the following rules , from the graph determine its domain , range and discuss its monotonicity and its type whether it is even , odd or otherwise and write its point of symmetry :

$\boxed{4}$ $g(x) = \frac{3x-5}{x-2}$

$(2,3)$



$g(x) = \frac{3x-5-1+1}{x-2}$

$g(x) = \frac{3x-6}{x-2} + \frac{1}{x-2}$

$g(x) = 3 + \frac{1}{x-2}$

$D = \mathbb{R} - \{2\}$

range $= \mathbb{R} - \{3\}$

Type N.N.

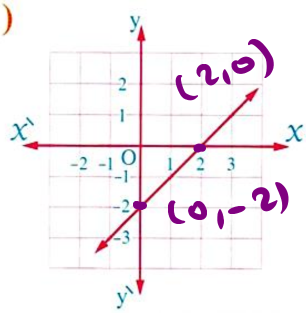
Mono.

dec. $]-\infty, 2[$, $]2, \infty[$

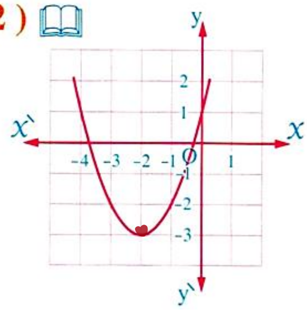
one-to-one

6) Write the rule of the function f that is represented graphically by each of the following figures :

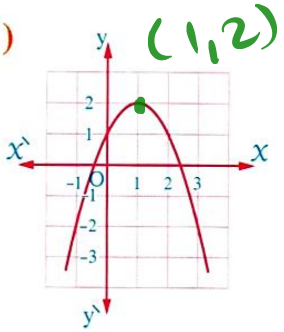
(1)



(2)



(3)



$\text{slope} = \frac{-2-0}{0-2} = 1$

$(-2,-3)$

$(1,2)$

$f(x) = ax + b$

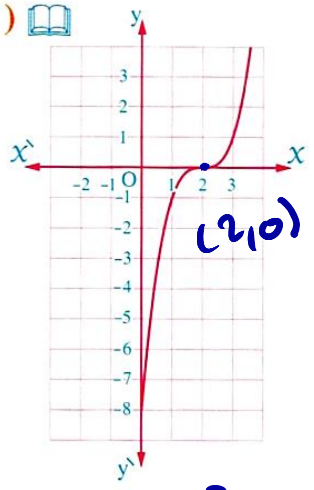
$f(x) = (x+2)^2 - 3$

$f(x) = -(x-1)^2 + 2$

$f(x) = x - 2$

6 Write the rule of the function f that is represented graphically by each of the following figures :

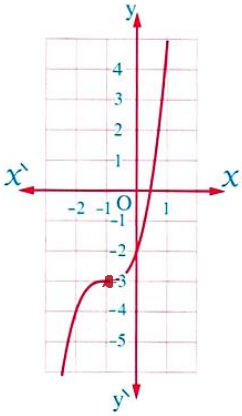
(4)



$f(x) = (x-2)^3$

(5)

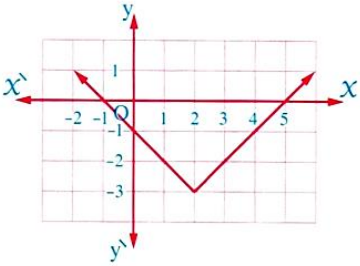
$(-1,-3)$



$f(x) = (x+1)^3 - 3$

(6)

$(2,-3)$



$f(x) = |x-2| - 3$