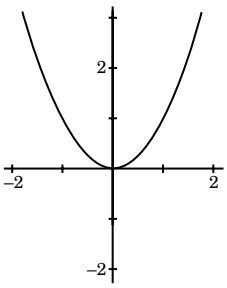
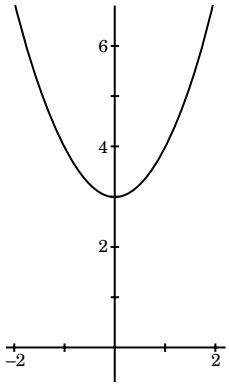
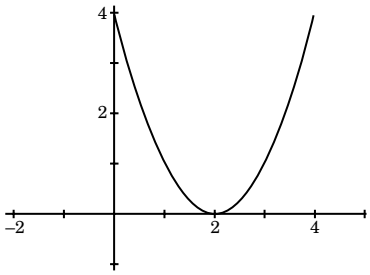
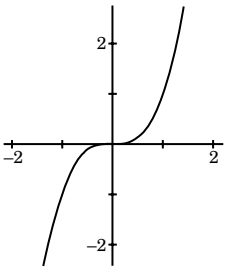
Exercice n° 7 : Translations

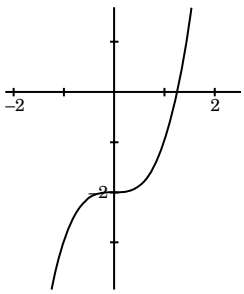
B-1

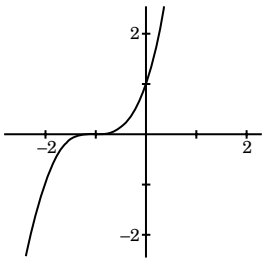
1. a. 

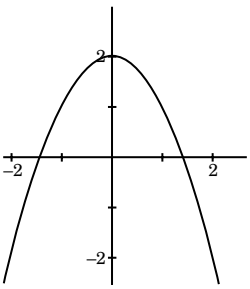
b. 

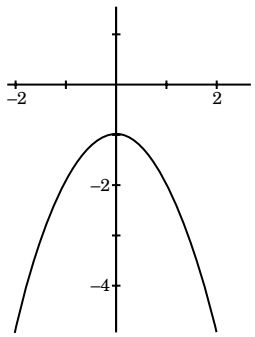
c. 

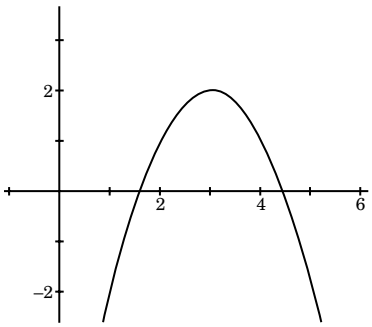
2. a. 

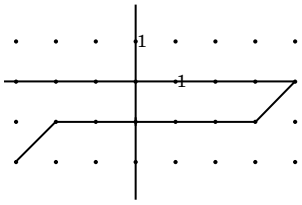
b. 

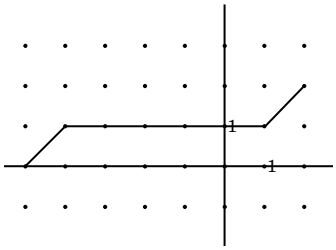
c. 

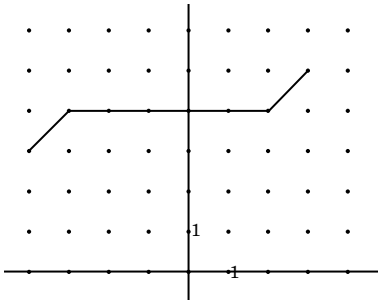
3. a. 

b. 

c. 

4. a. 

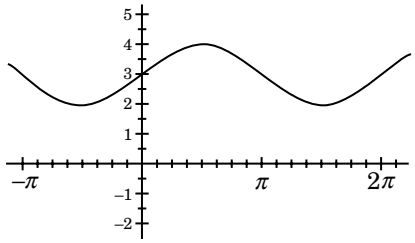
b. 

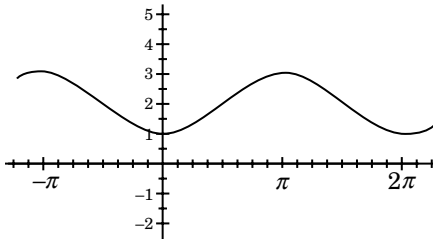
c. 

Suite

Exercice n° 7 :Translations

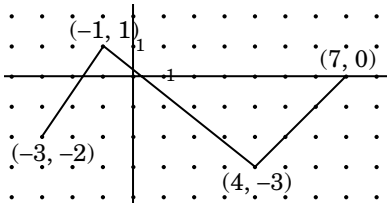
B-1

5. 

6. 

7. Question 5 :
Image : $\{2 \le y \le 4\}$
Période : 2π
Amplitude : 1

Question 6 :
Image : $\{1 \le y \le 3\}$
Période : 2π
Amplitude : 1

8. 

9. a. $f(x) = g(x) + 4$

b. $g(x) = f(x) - 4$

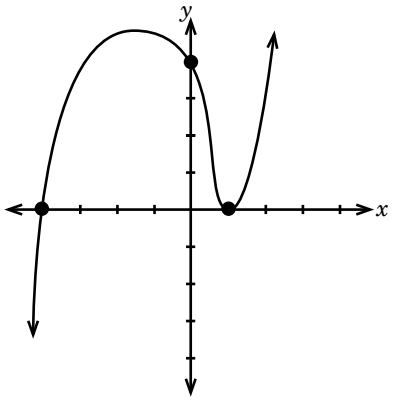
10. $\theta = \frac{5\pi}{12}, \frac{7\pi}{12}, \frac{13\pi}{12}, \frac{15\pi}{12}, \frac{21\pi}{12}, \frac{23\pi}{12}$

11. $\theta = 2{,}8018;\ 0{,}3398$

12. Domaine : $\{x \in \Re\}$ Image : $\{0 \le y \le 2\}$

13. Consulter le solutionnaire pour une preuve détaillée.

14. Deux réponses possibles sont : $(\cos\theta + 1)(\sin\theta - 1) = 0$
$\cos^2\theta + \cos\theta = 0$
D'autres réponses sont possibles.

15. 

16. $f(x) = \frac{1}{6}(x + 2)^2(x - 3)(x - 4)$
ou $f(x) = \frac{1}{3}(x + 2)(x - 3)(x - 4)$

17. $x = 5$ et $x = 11$

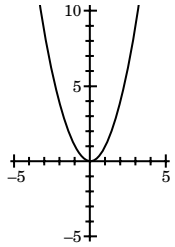
18. 12

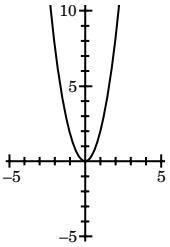
19. a. $y = 2x$
b. $y = -2x + 16$

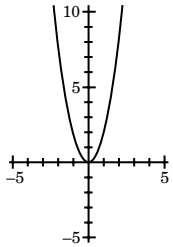
20. $x^2 + 8x + 17$

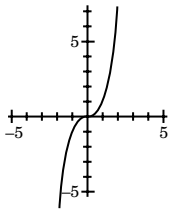
<u>Exercice n° 8</u> : Dilatations horizontales et verticales

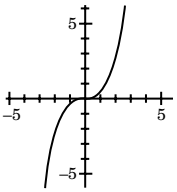
B-2

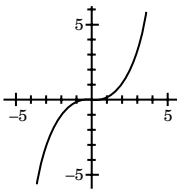
1. a. 

b. 

c. 

2. a. 

b. 

c. 

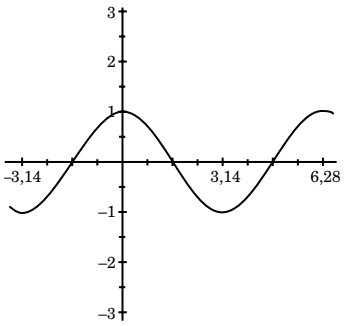
3. a. 

Image : $\{-1 \le y \le 1\}$
Période : 2π
Amplitude : 1

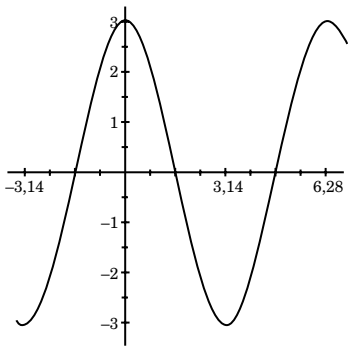
b. 

Image : $\{-3 \le y \le 3\}$
Période : 2π
Amplitude : 3

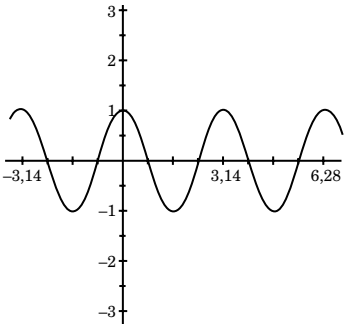
c. 

Image : $\{-1 \le y \le 1\}$
Période : π
Amplitude : 1

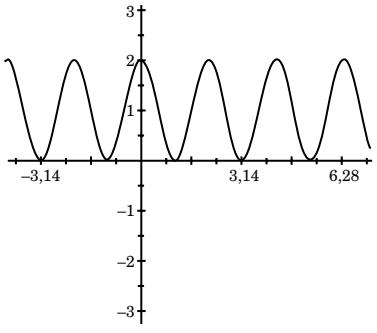
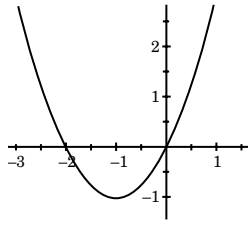
d. 

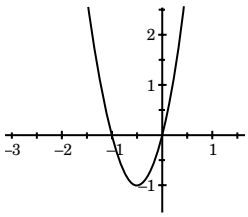
Image : $\{0 \le y \le 2\}$
Période : $\frac{2\pi}{3}$
Amplitude : 1

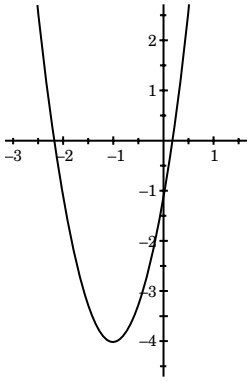
Suite

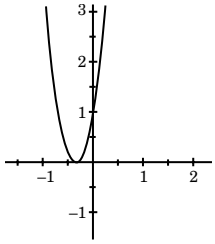
<u>Exercice n° 8</u> : Dilatations horizontales et verticales

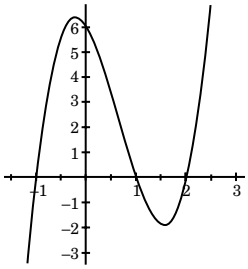
B-2

4. a. 

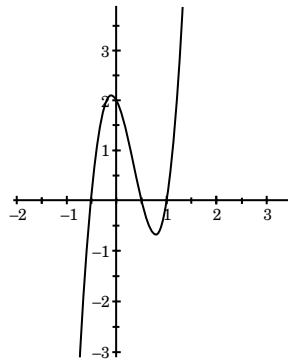
b. 

c. 

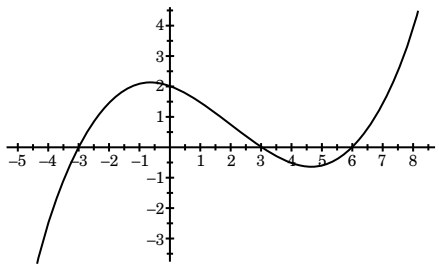
d. 

5. 

Étirement vertical d'un facteur de 3.

6. 

Étirement horizontal d'un facteur de $\frac{1}{2}$.

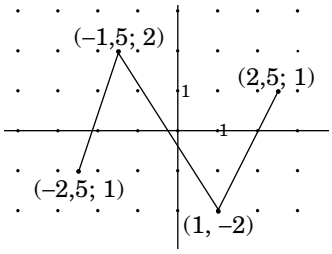
7. 

Étirement horizontal d'un facteur de 3.

Suite

Exercice n° 8 : Dilatations horizontales et verticales

B-2

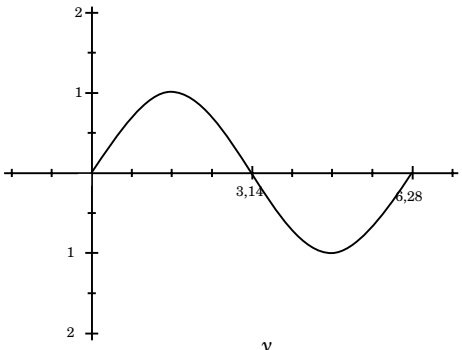
8. 

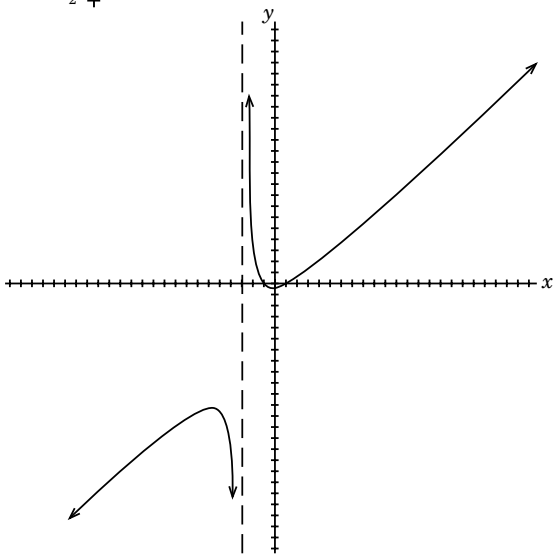
9. a. $f(x) = g(2x)$ b. $g(x) = f\left(\frac{1}{2}x\right)$

10. $\frac{7\pi}{6} + 2k\pi, \frac{11\pi}{6} + 2k\pi, \frac{3\pi}{2} + 2k\pi,$ où k est un entier relatif.

11. $2\cos^2\theta - \sqrt{3}\cos\theta = 0$

12. $\theta = \frac{2\pi}{3} + 2k\pi,\ \frac{4\pi}{3} + 2k\pi,\ \pi + 2k\pi,$ où $k \in Z$

13. 

14. 

Domaine : $\{x \mid x \neq -3\}$

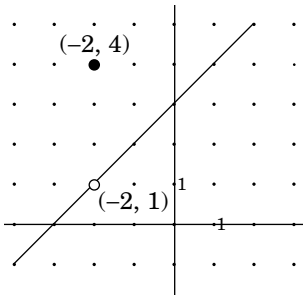
Image : $\{y \mid y \leq -11,65 \text{ ou } y \geq -0,34\}$

Remarque : Les valeurs pour l'image sont approximatives

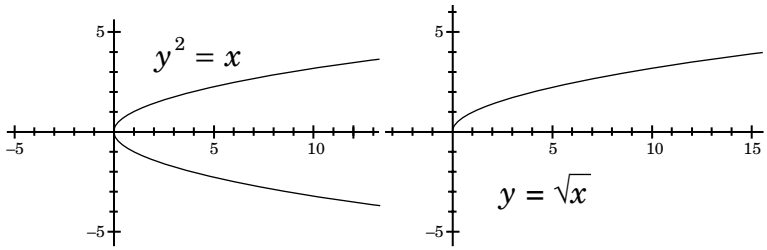
Suite

<u>Exercice n° 8</u> : Dilatations horizontales et verticales

B-2

15. 

16. Consulter le solutionnaire pour une réponse détaillée. (Conseil : Quelle est la valeur de l'angle au centre?)

17. 

$y^2 = x$ est une parabole, mais $y = \sqrt{x}$ est une demi-parabole.

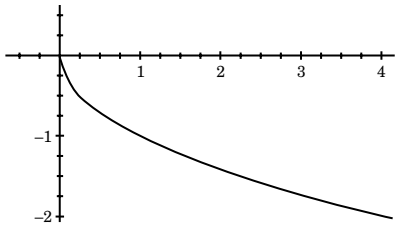
18. $k = -30$

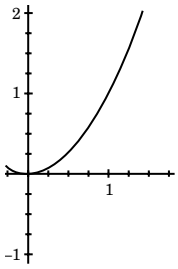
19. $k = 7$

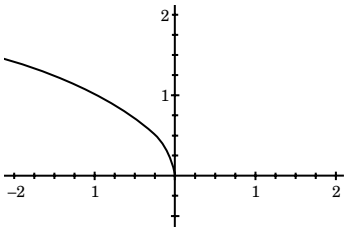
20. a. 18π b. $\frac{1}{6}\pi r^2$ c. $\frac{1}{2}\theta r^2$

Exercice n° 9 : Symétries, réflexions et réciproques

B-3

1. 

2. 

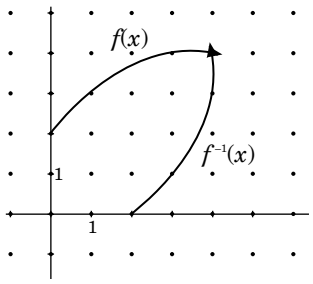
3. 

4. a. pair
   b. ni l'un ni l'autre
   c. pair
   d. impair
   e. pair
   f. pair

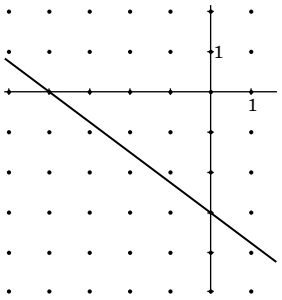
5. a. Les équations i., iii. et iv. sont symétriques par rapport à l'axe des y.
   b. Remplace y par $-y$. S'il n'y a pas de changement de la valeur de x, alors le graphique est symétrique par rapport à l'axe des x.

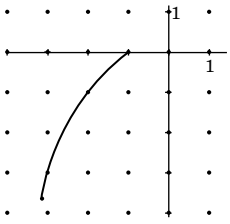
6. a. $y = \sin x$ n'est symétrique à aucun des axes.
   b. $y = \cos x$ est symétrique par rapport à l'axe des y.

7. a. $y = -2x - 4$
   b. $y = -2x + 4$

8. 

$f^{-1}(x) = (x - 2)^2,\ x \geq 2$

9. a. 

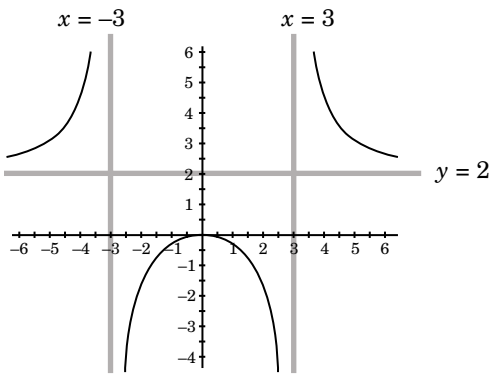
b. 

Suite

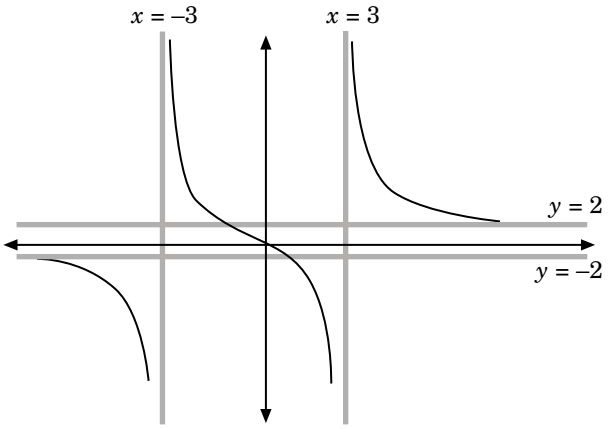
Exercice n° 9 : Symétries, réflexions et réciproques

B-3

10. a.

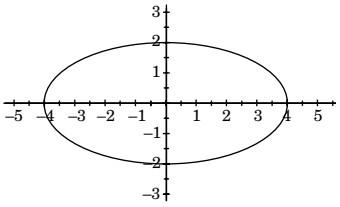


b.

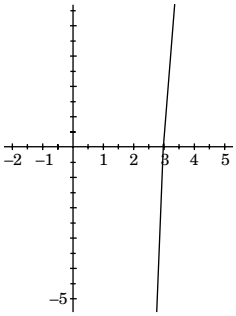


11. $\theta = 2{,}09 + 2k\pi$; $4{,}19 + 2k\pi$, où k est un entier relatif.

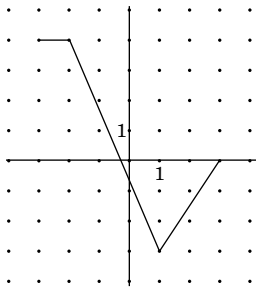
12. a.



b.



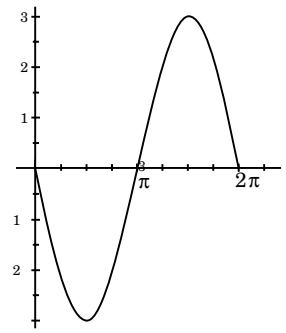
c.



Suite

<u>Exercice n° 9</u> : Symétries, réflexions et réciproques

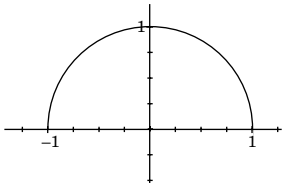
B-3

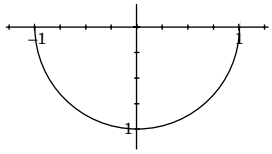
13. 

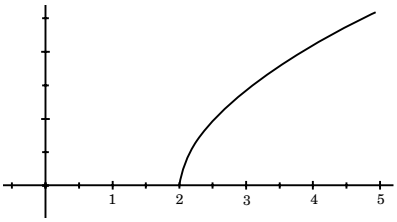
14. $\theta = 0{,}7298 + 2k\pi$; $2{,}4118 + 2k\pi$, où k est un entier relatif.

15. $3\sqrt{5}$

16. $\theta = 0{,}34$ ou $2{,}80$

17. a. 

b. 

18. 

C'est une demi-parabole.

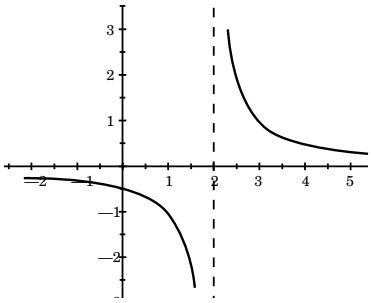
19. Toute parabole de la forme $y = a(x - 1)(x - 3)$.

20. $y = -16(x - 1)(x - 3)$

Exercice n° 10 : Graphique de $y = \dfrac{1}{f(x)}$

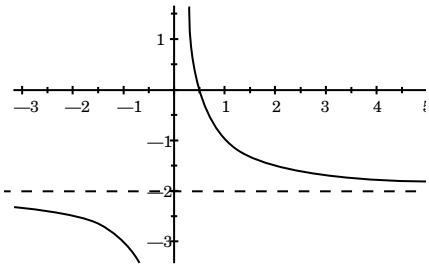
B-4

1. a.



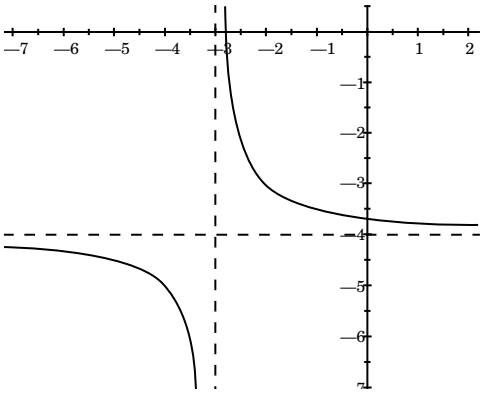
Domaine : Réels, $x \neq 2$
Image : Réels, $y \neq 0$
Zéros : Aucun

b.



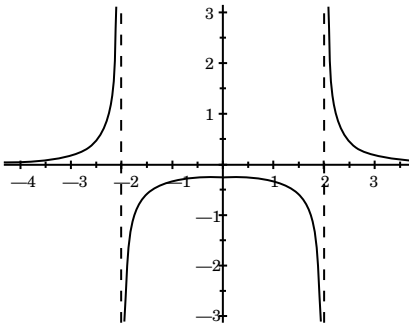
Domaine : Réels, $x \neq 0$
Image : Réels, $y \neq -2$
Zéros : $\dfrac{1}{2}$

2.



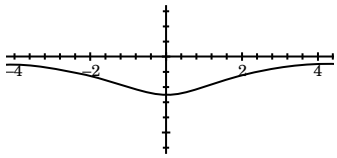
Domaine : Réels, $x \neq -3$
Image : Réels, $y \neq -4$
Zéros : $\dfrac{-11}{4}$

3.



Domaine : $\{x \in \Re \mid x \neq \pm 2\}$
Image : $\left]-\infty, \dfrac{-1}{4}\right] \cup]0, \infty[$
Zéros : Aucun

4.



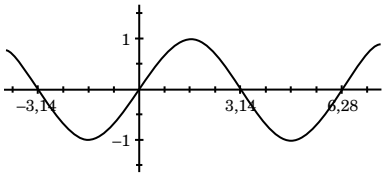
Domaine : $\{x \in \Re\}$
Image : $\left[\dfrac{-1}{4}, 0\right[$
Zéros : Aucun

Suite

<u>Exercice n° 10</u> : Graphique de $y = \dfrac{1}{f(x)}$

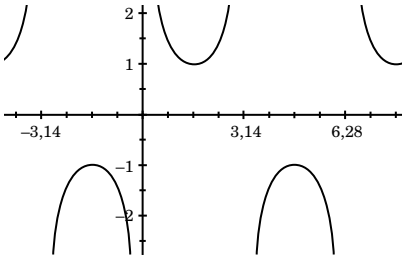
B-4

5. a.



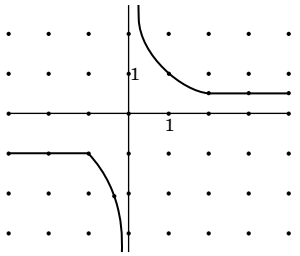
Domaine : $\{x \in \Re\}$
Image : $\{-1 \le y \le 1\}$
Zéros : $n\pi$, $n \in Z$

b.



Domaine : $\{x \in \Re \mid x \neq n\pi, n \in Z\}$
Image : $\{y \le -1 \text{ ou } y \ge 1\}$
Zéros : Aucun

6.



7. $\theta = 107{,}70^o; 162{,}3^o; 287{,}7^o; 342{,}3^o$

8. IV

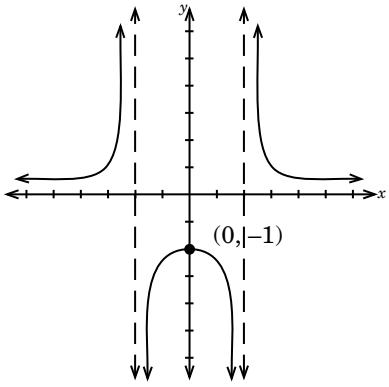
9. $\dfrac{-2\sqrt{3}}{3}$

10. C

11. a. 270^o b. $3265{,}86^o$ c. $-487{,}01^{o\cdot\cdot}$ d. -3960^o

12. $\alpha = 0{,}4636; 3{,}605$; $\beta = 2{,}419; 3{,}864$

13.



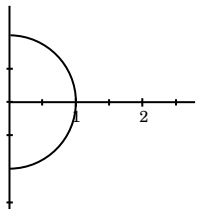
Suite

Exercice n° 10 : Graphique de $y = \dfrac{1}{f(x)}$

B-4

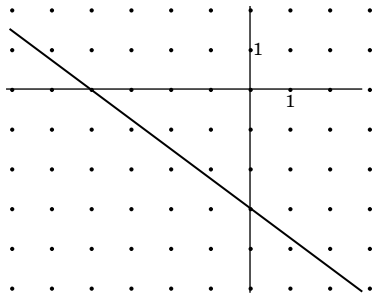
14. a. $-\dfrac{1}{4} < k \leq 0$ b. $k = -\dfrac{1}{4}$ c. $k < -\dfrac{1}{4}$ ou $k > 0$

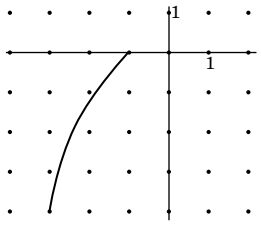
15. Consulter le solutionnaire pour une preuve détaillée.

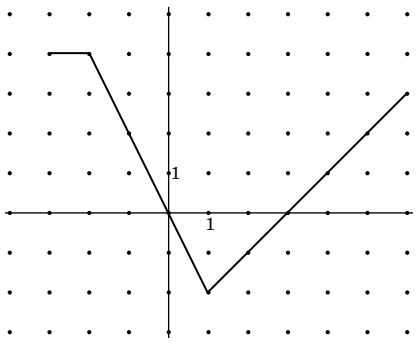
16. 

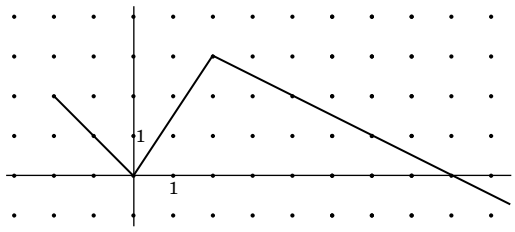
17. $y = \dfrac{3}{8}x^2 - \dfrac{9}{4}x - \dfrac{21}{8}$

18. $\theta = 0,\ \dfrac{2\pi}{3},\ \pi,\ \dfrac{4\pi}{3},\ 2\pi$

19. a. 

b. 

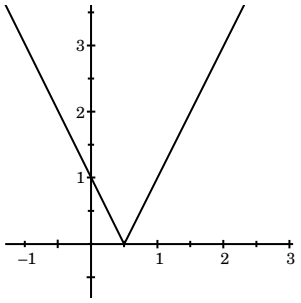
c. 

d. 

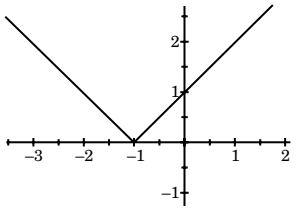
20. $\sqrt{244 - 120\sqrt{2}}$ ou $2\sqrt{61 - 30\sqrt{2}}$

Exercice n° 11 : Graphique de $|f(x)|$

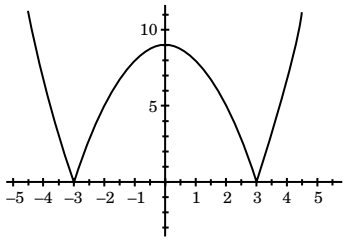
B-5, B-6

1. 

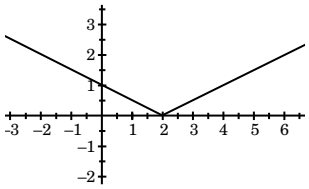
Domaine : Réels
Image : $y \geq 0$
Zéros : $\frac{1}{2}$

2. 

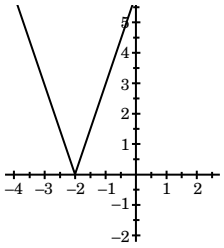
Domaine : Réels
Image : $y \geq 0$
Zéros : -1

3. 

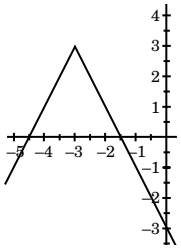
Domaine : Réels
Image : $y \geq 0$
Zéros : ± 3

4. 

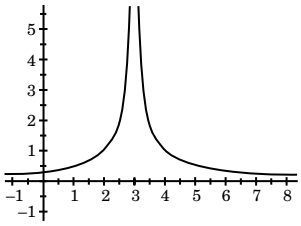
Domaine : Réels
Image : $y \geq 0$
Zéros : 2

5. 

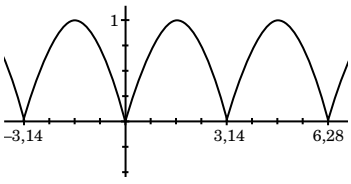
Domaine : Réels
Image : $y \geq 0$
Zéros : -2

6. 

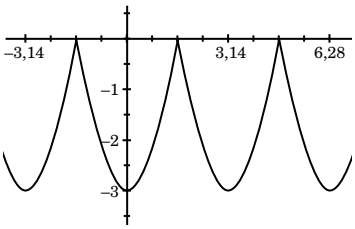
Domaine : Réels
Image : $y \leq 3$
Zéros : $\frac{-3}{2}, \frac{-9}{2}$

7. 

Domaine : $x \neq 3$
Image : $y \geq 0$
Zéros : Aucun

8. 

Domaine : Réels
Image : $0 \leq y \leq 1$
Période : π

9. 

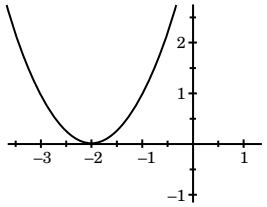
Domaine : Réels
Image : $-3 \leq y \leq 0$
Période : π

Suite

Exercice n° 11 : Graphique de $|f(x)|$

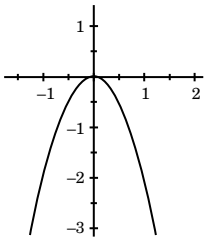
B-5, B-6

10. a.



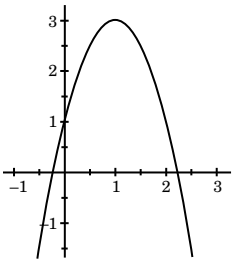
Zéros : –2

b.



Zéros : 0

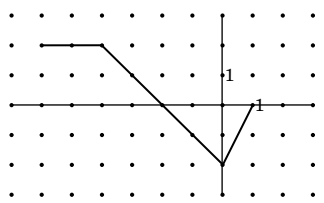
c.



Zéros : $1 \pm \sqrt{1,5}$

11. Image : $\{-5 \le y \le 1\}$
Période : 4π
Amplitude : 3

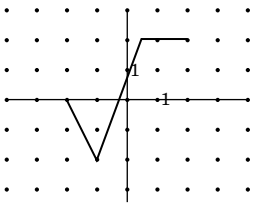
12. a.



Domaine : $-6 \le x \le 1$

Image : $-2 \le y \le 2$

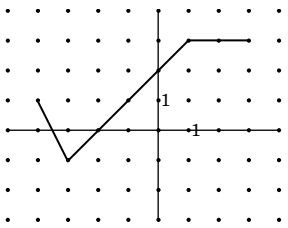
b.



Domaine : $-2 \le x \le \frac{3}{2}$

Image : $-2 \le y \le 2$

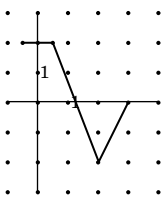
c.



Domaine : $-5 \le x \le 2$

Image : $-2 \le y \le 2$

d.



Domaine : $\frac{-1}{2} \le x \le 3$

Image : $-2 \le y \le 2$

13. $\theta = 1{,}0472; 5{,}2360$ ou $\theta = \frac{\pi}{3}, \frac{5\pi}{3}$

Suite

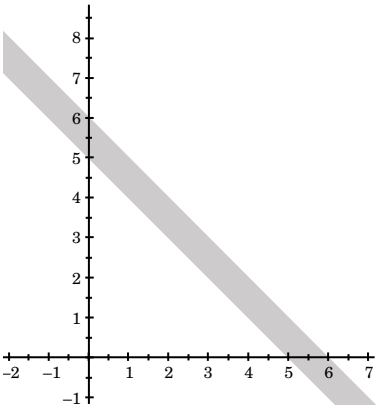
<u>Exercice n° 11</u> : Graphique de $|f(x)|$

B-5, B-6

14. a. $f(x) = x^2 + 5$ (Autres sont possibles) b. $f(x) = |x - 3| + 5$ c. $f(x) = \sqrt{5x - 3} + 5$

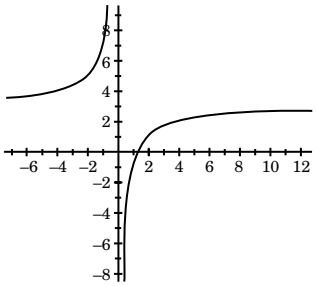
15. Voir le solutionnaire.

16. $a = \frac{5}{3}$, $c = \frac{-14}{3}$

17. 

(x, y) se situe sur le ruban entre les droites $x + y = 5$ et $x + y = 6$

18. ± 2

19. 

20. Consulter le solutionnaire pour une preuve détaillée.

<u>Exercice n° 12</u> : Transformations – Exercices supplémentaires

B-6

1. a. étirement vertical
   b. réflexion par rapport à l'axe des "x"

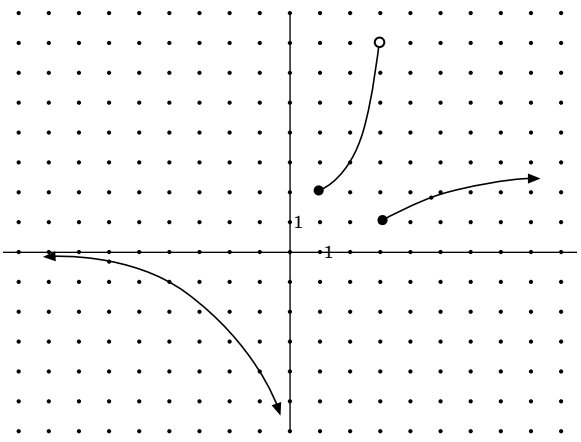
2. a. compression verticale
   b. étirement vertical et réflexion par raport à l'axe des "x"

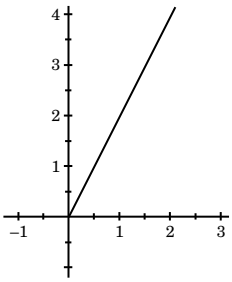
3. a. compression verticale et réflexion par rapport à l'axe des "x"
   b. compression horizontal

4. a. étirement vertical et translation verticale de 1 unité vers le haut
   b. réflexion par rapport à l'axe des "x", translation verticale de 6 unités vers le haut

5. a. translation horizontle de 1 unité vers la gauche, étirement vertical
   b. translation horizontale de 2 unités vers la droite, étirement vertical

6. a. compression verticale, translation verticale de 5 unités vers le bas
   b. compression verticale, translation verticale de 4 unités vers le haut

7. 

8. 

Suite

Exercice n° 12 : Transformations – Exercices supplémentaires

B-6

9. a.

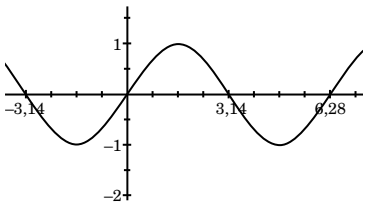


Image : $\{-1 \le y \le 1\}$
Période : 2π
Amplitude : 1

b.

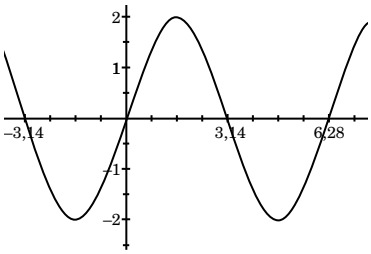


Image : $\{-2 \le y \le 2\}$
Période : 2π
Amplitude : 2

c.

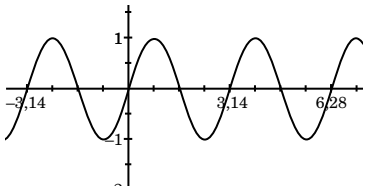


Image : $\{-1 \le y \le 1\}$
Période : π
Amplitude : 1

10. a.

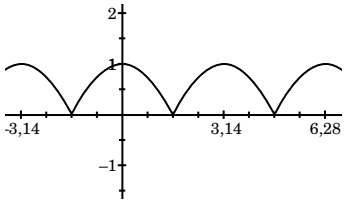


Image : $\{0 \le y \le 1\}$
Période : π

b.

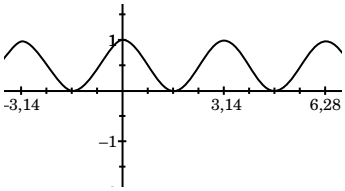


Image : $\{0 \le y \le 1\}$
Période : π

c.

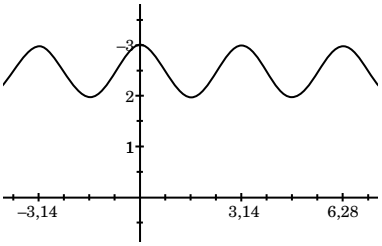
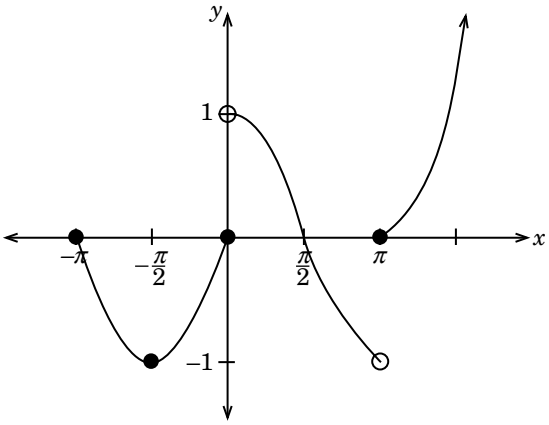


Image : $\{2 \le y \le 3\}$
Période : π

11.

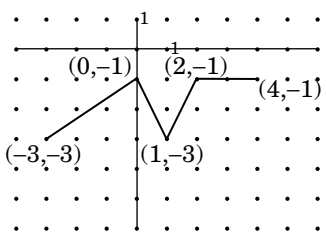


12. (1,72, 5,28)

Suite

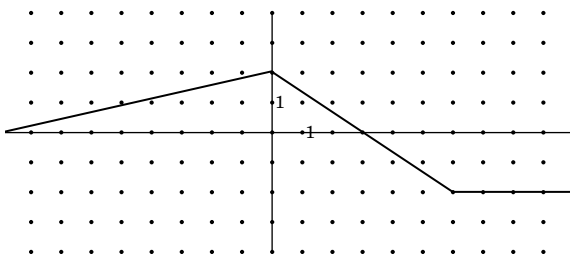
Exercice n° 12 : Transformations – Exercices supplémentaires

B-6

13. 

Domaine : $\{-3 \le x \le 4\}$

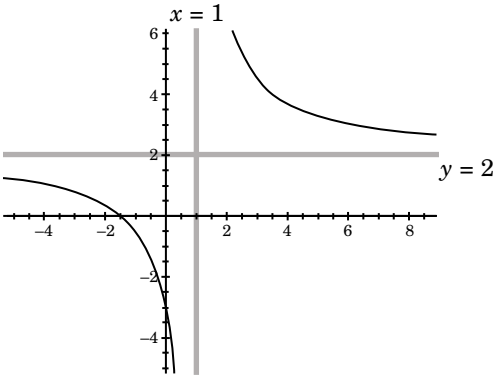
Image : $\{-3 \le y \le -1\}$

14. 

$\{-9 \le x \le 12\}$

$\{-2 \le y \le 2\}$

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

16. 

17. C

18. E

19. $n = 3$

20. 34,91 dm^2

<u>Exercice n° 13</u> : Transformations – Fonctions trigonométriques

B-7

1. $y = 5\sin\left(\frac{1}{2}x\right)$

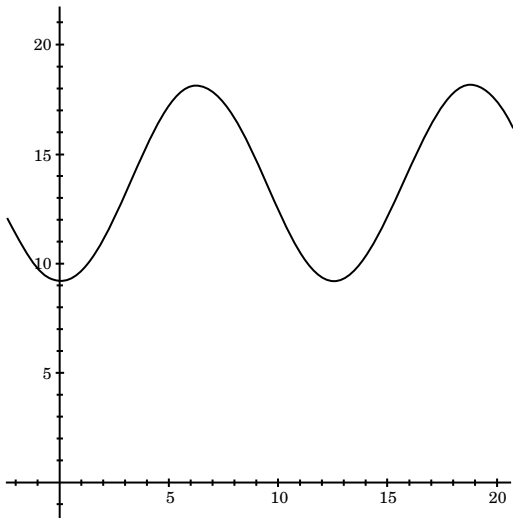
2. $y = 5\cos\left(\frac{1}{2}(x-\pi)\right)$

3. $y = 3\sin\left(2\left(x+\frac{\pi}{4}\right)\right)$ ou $y = -3\sin\left[2\left(x-\frac{\pi}{4}\right)\right]$

4. $y = 3\cos 2x$

5. $y = 2+2\sin\left(\frac{3}{2}x\right)$ ou $y = 2\cos\left[\frac{3}{2}\left(x-\frac{\pi}{3}\right)\right]+2$

6. a.



b. 12,5 heures

c. 5,54 heures

7. $y = 13{,}9 - 9{,}7\cos\left(\frac{2\pi}{365}(t-26)\right)$

8. 18,5°

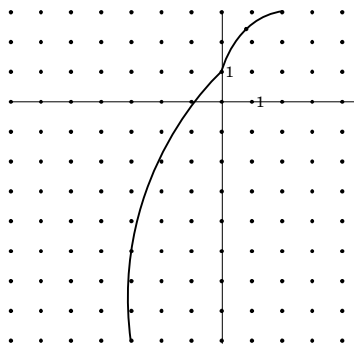
9. 87 jours

10. 80,41°

11. a. 2,8449 b. 3,2987 c. 3,7699 d. 6,1436

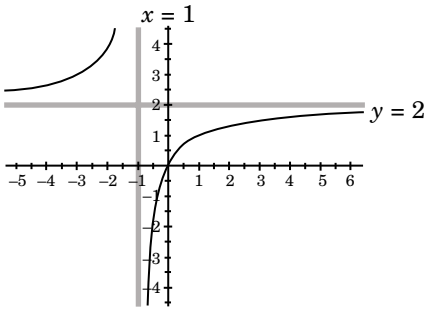
Suite

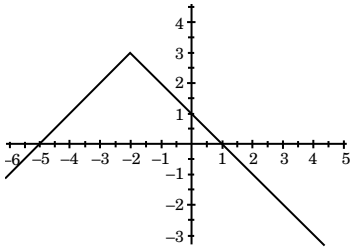
Exercice n° 13 : Transformations – Fonctions trigonométriques

12. 

13. $r = \dfrac{p}{m^2xp - 1}$

14. a. 4 b. 5 c. 3 d. 2 e. 1

15. 

16. 

17. a. Consulter le solutionnaire pour une preuve détaillée.
    b. $75\sqrt{2}$

18. $k = -16$

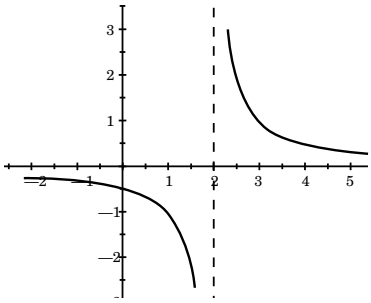
19. $y = 3, x = 121$

20. a. Nombre infini.
    b. $y = x(x - 2)$, $y = 5x(x - 2)$ et une infinité d'autres.

Exercice n° 10 : Graphique de $y = \dfrac{1}{f(x)}$

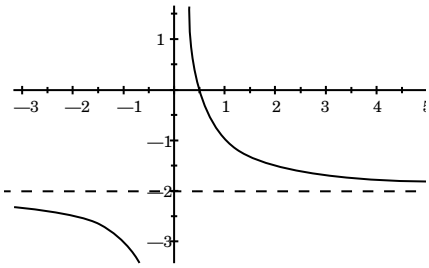
B-4

1. a.



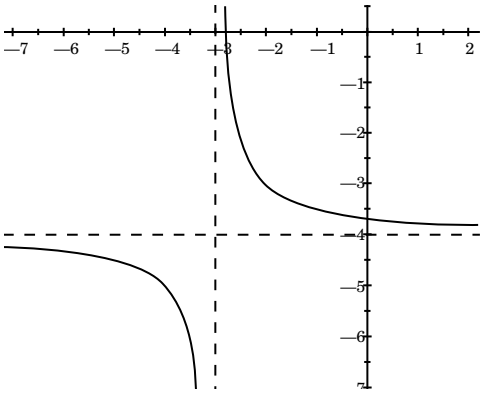
Domaine : Réels, $x \neq 2$
Image : Réels, $y \neq 0$
Zéros : Aucun

b.



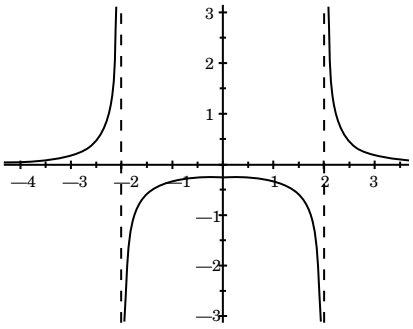
Domaine : Réels, $x \neq 0$
Image : Réels, $y \neq -2$
Zéros : $\dfrac{1}{2}$

2.



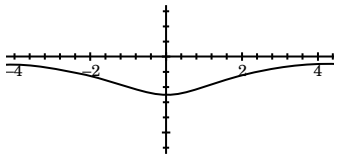
Domaine : Réels, $x \neq -3$
Image : Réels, $y \neq -4$
Zéros : $\dfrac{-11}{4}$

3.



Domaine : $\{x \in \Re \mid x \neq \pm 2\}$
Image : $\left]-\infty, \dfrac{-1}{4}\right] \cup]0, \infty[$
Zéros : Aucun

4.



Domaine : $\{x \in \Re\}$
Image : $\left[\dfrac{-1}{4}, 0\right[$
Zéros : Aucun

Suite