1

Halla el dominio de definición de estas funciones:

a) $y=\dfrac{2}{5x-x^2}$

$Dom\ f=\mathbb{R}-\{x:\ 5x-x^2=0\}$

$Dom\ f=\mathbb{R}-\{0,5\}$

b) $y=\sqrt{x^2-4x-5}$

$Dom\ f=\{x\in\mathbb{R}:\ x^2-4x-5\geq 0\}$

$Dom\ f=(-\infty,-1]\cup[5,\infty)$

2

Dadas las siguientes funciones:

$f(x)=\sqrt{3x-2}$; $g(x)=x^2-5$, calcula:

a) $(g\circ f)(9)$

$(g\circ f)(x)=g(f(x))$

$g(f(x))=\left(\sqrt{3x-2}\right)^2-5$

$g(f(x))=3x-7$

$(g\circ f)(9)=3\cdot 9-7=\boxed{20}$

b) $f^{-1}(4)$

$y=\sqrt{3x-2}$

$(x)^2=\left(\sqrt{3y-2}\right)^2$

$x^2=3y-2$

$f^{-1}(x)=\dfrac{x^2+2}{3}$

$f^{-1}(4)=\boxed{6}$

3

Un cultivo de bacterias crece según la función

$y=2^{\frac{x}{5}}+2$ (y: miles de bacterias, x: horas)

a) ¿Cúantas había en el momento inicial?

b) ¿Cuánto tardarán en duplicarse?

c) Cuál será su número si pasa un día.

a) $f(0)=2^{\frac{0}{5}}+2=1+2=3\ \rightarrow\ (3.000\ bacterias)$

b) El doble son 6.000 $\rightarrow\ y=6$

$6=2^{\frac{x}{5}}+2$; $4=2^{\frac{x}{5}}$; $2^2=2^{\frac{x}{5}}$

$2=\dfrac{x}{5}$; $x=10\ \rightarrow\ (10\ horas)$

c) $f(24)=2^{\frac{24}{5}}+2=29,857\ \rightarrow\ (29.857\ bacterias)$

4

Una llamada de cinco minutos a un 902 me ha costado 2,65€ y por 15 minutos pagué 7,65€.

a) Representa la función *tiempo-gasto* y busca su expresión analítica

b) Calcula el precio de una llamada de 9 minutos

x	y
5	2.65
…	…
15	7.65

$m=\dfrac{7.65-2.65}{15-5}=\dfrac{5}{10}=\dfrac{1}{2}$

$y=\dfrac{1}{2}(x-5)+2.65$

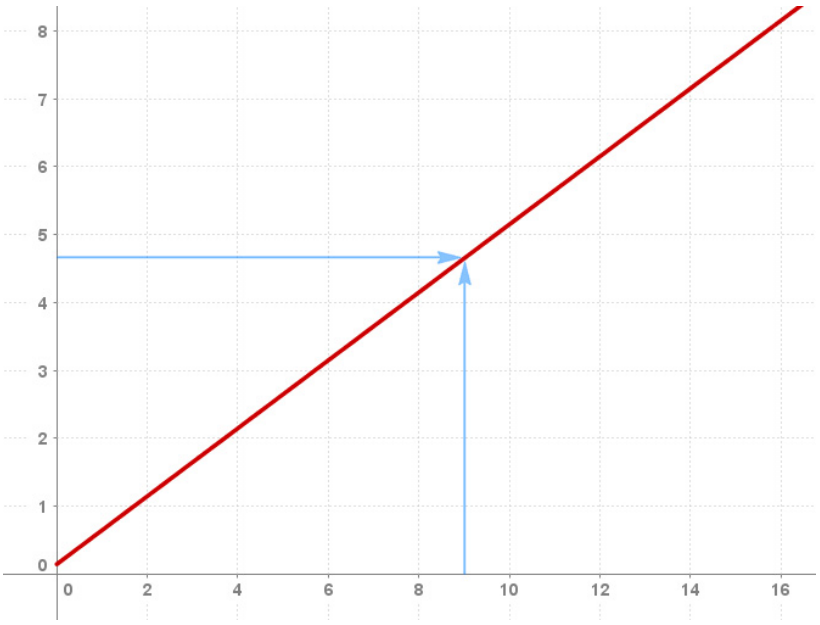
$y=0.5x+0.15$

interpolar:

$f(9)=0.5\cdot 9+0.15$

$f(9)=4.65$

$9\ \text{min}\ \rightarrow\ 4.65€$



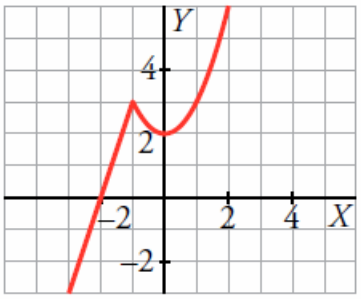
5

Completa la tabla:

	$y=\text{sen}(x)$	$y=\cos(x)$	$y=\text{tg}(x)$
Periodicidad	2π	2π	π
Dominio	$\mathbb{R}$	$\mathbb{R}$	$\mathbb{R}-\left\{x:\frac{\pi}{2}+\pi k\right\}$
Recorrido	$[-1,1]$	$[-1,1]$	$\mathbb{R}$
Simetría	Respecto del origen	Respecto del eje Y	Respecto del origen
Asíntotas	No tiene	No tiene	$x=\frac{\pi}{2}+\pi k$
Intersección eje X	πk	$x=\left\{\frac{\pi}{2}+\pi k\right\}$	πk

6

a) Obtén la expresión analítica de esta función:

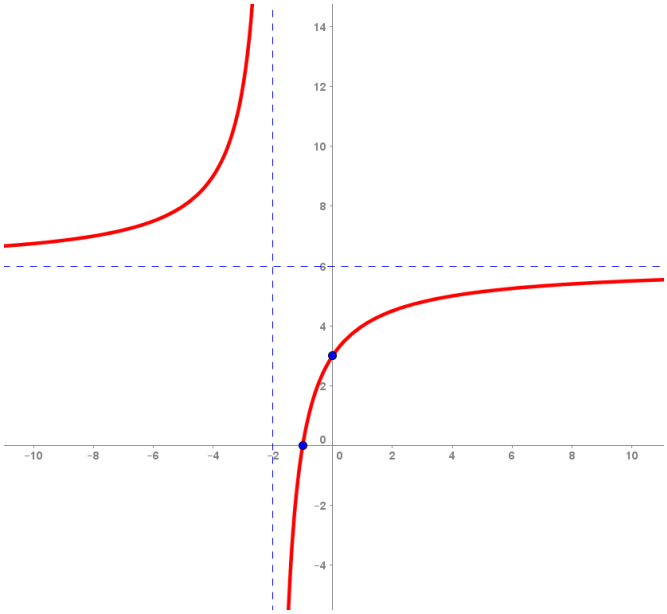


$$f(x)=\begin{cases}3x+6 & si\ x\le -1\\ x^2+2 & si\ x>-1\end{cases}$$

si $x\le -1$, recta que pasa por $(-2,0)$ y $(-1,3)$

si $x\ge -1$, parábola que pasa por $(0,2),\ (1,3),\ldots$

b) Representa gráficamente la siguiente función: $y=\frac{6x+6}{x+2}$



x	y
-8,0	7,0
-7,0	7,2
-6,0	7,5
-5,0	8,0
-4,0	9,0
-3,0	12,0
-2,0	Error
-1,0	0
0	3,0
1,0	4,0
2,0	4,5
3,0	4,8
4,0	5,0
5,0	5,1429
6,0	5,25
7,0	5,3333
8,0	5,4

AV: $x=-2$; AH: $y=6$; Gráfica: Hipérbola

Creciente en todo su dominio

7

Asocia a cada gráfica su expresión analítica. Colócalas en el grupo al que pertenecen.

(A) $y=ln\,x$

(B) $y=-log_2\,x$

(C) $y=-0{,}5x^2+3$

(D) $y=cos\,2x$

(E) $y=\sqrt{x+2}$

(F) $y=2^{1-x}$

(G) $y=-(1/2)^x$

(H) $y=-\sqrt{-x}$

(I) $y=-sen\,x$

(J) $y=|4-x|$

(K) $y=e^x$

(L) $y=log_2\,(x+3)$

(M) $y=3x^2+5x-1$

(N) $y=\frac{1}{x}+2$

(O) $y=2sen\,x$

(P) $y=\frac{1}{2}-\frac{x}{3}$

(Q) $y=|3x+6|$

(R) $y=2\sqrt{4-x}$

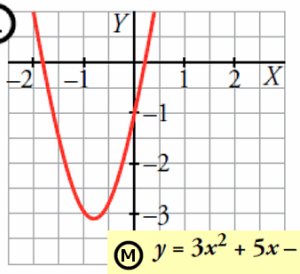
(S) $y=\frac{2}{x}$

(T) $y=1+cos\,x$

Lineales	P
Cuadráticas:	C, M
Proporcionalidad inversa	N, S
Radicales	E, H, R
Definidas por intervalos	J, Q
Logarítmicas	A, B, L
Exponenciales	F, G, K
Trigonométricas	D, I, O, T

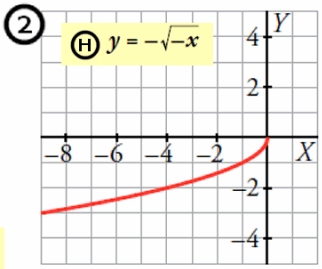
7

1



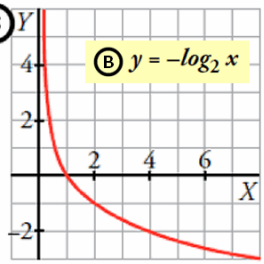
Ⓜ $y = 3x^2 + 5x - 1$

2



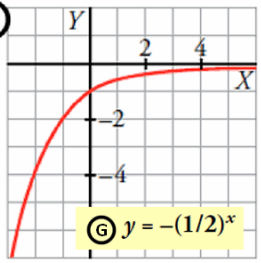
Ⓗ $y = -\sqrt{-x}$

3



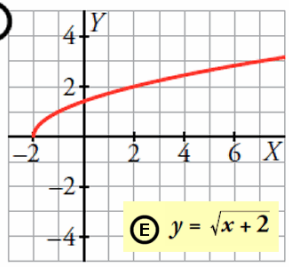
Ⓑ $y = -\log_2 x$

4



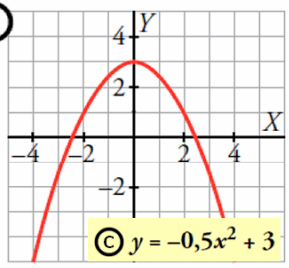
Ⓖ $y = -(1/2)^x$

5



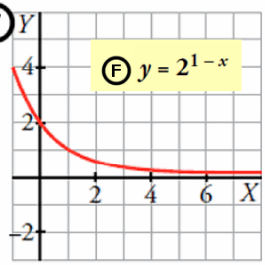
Ⓔ $y = \sqrt{x+2}$

6



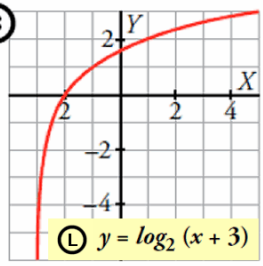
Ⓒ $y = -0{,}5x^2 + 3$

7



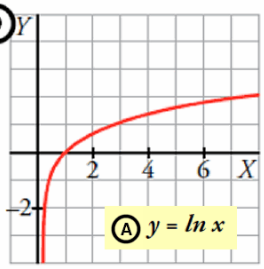
Ⓕ $y = 2^{1-x}$

8



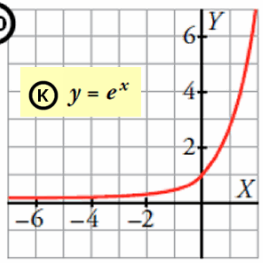
Ⓛ $y = \log_2 (x + 3)$

9



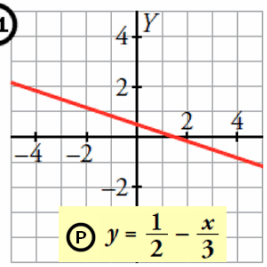
Ⓐ $y = \ln x$

10



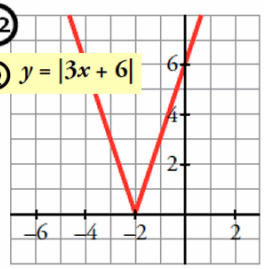
Ⓚ $y = e^x$

11



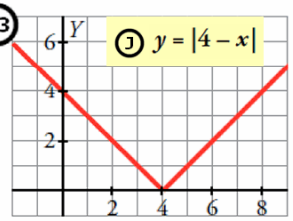
Ⓟ $y = \frac{1}{2} - \frac{x}{3}$

12



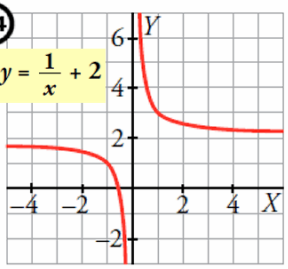
Ⓠ $y = |3x + 6|$

13



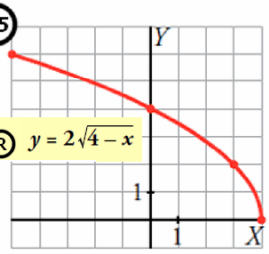
Ⓙ $y = |4 - x|$

14



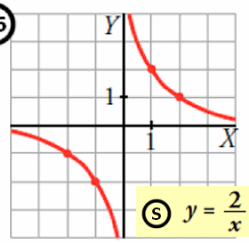
Ⓝ $y = \frac{1}{x} + 2$

15



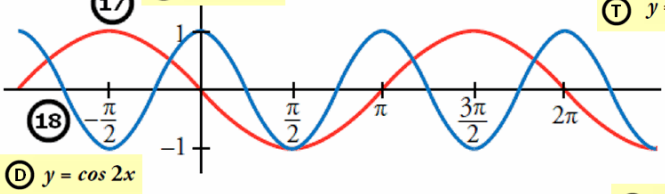
Ⓡ $y = 2\sqrt{4 - x}$

16



Ⓢ $y = \frac{2}{x}$

17



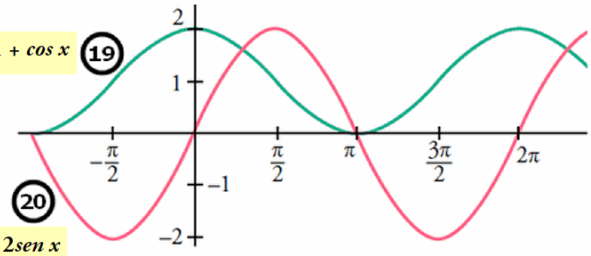
Ⓘ $y = -sen\ x$

18

Ⓓ $y = cos\ 2x$

Ⓣ $y = 1 + cos\ x$

19



20

Ⓞ $y = 2sen\ x$