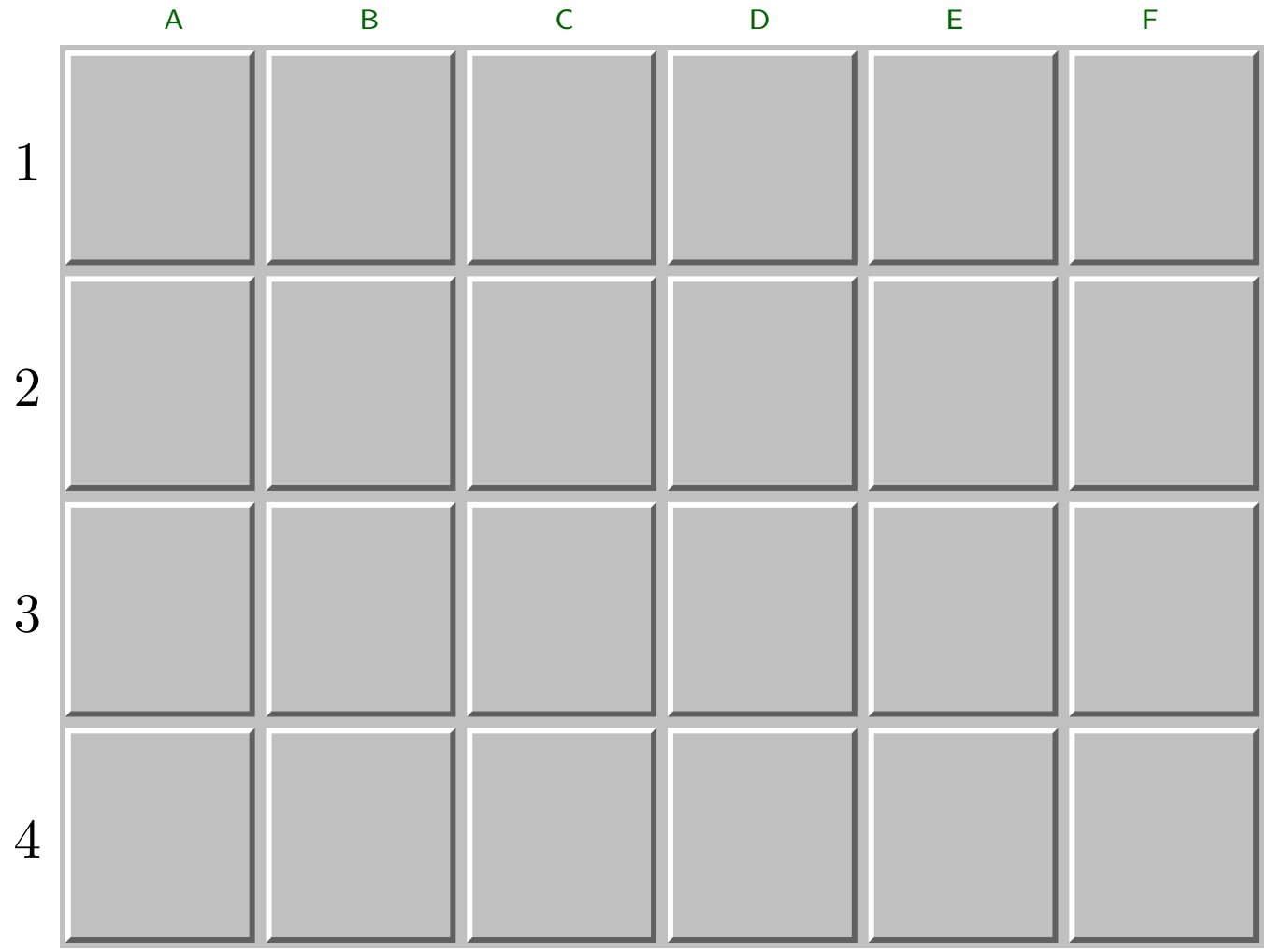
Jeopardy Game



Solution

A

$$\ln \frac{x}{y} =$$

a $\ln x + \ln y$

b $\ln x - \ln y$

c $x \ln y$

d $y \ln x$

e none of them

A

The function $y = x^2 \cdot \sin x$ is

a odd

b even

c neither odd nor even

A

$\arctan 1 =$

a ∞

b $\frac{\pi}{3}$

c $\frac{\pi}{4}$

d $\frac{\pi}{6}$

e none of them

A

The equivalence "$a < b$ if and only if $f(a) < f(b)$" is the property of

a even functions

b one-to-one functions

c continuous functions

d increasing functions

e none of them

B

How many points of inflection is on the graph of the function $y = \sin x$ in the open interval $(0, 2\pi)$

a none

b one

c two

d three

e none of them

B

Find points of discontinuity of the function $y = \dfrac{x-4}{(x-2)\ln x}$

a	none
b	0
c	0, 1
d	0, 1, 2
e	0, 2
f	0, 1, 4
g	0, 4
h	none of them

B

Let f be a function and f^{-1} be its inverse. Then $f^{-1}\big(f(x)\big) =$

a	0
b	1
c	x
d	$f(x)$
e	$f^{-1}(x)$
f	none of them

B

$\arcsin(\sin x) = x$ for every $x \in \mathbf{R}$

a Yes

b No

C

$$\lim_{x \to -\infty} \operatorname{arctg} x =$$

a 0

b $\frac{\pi}{2}$

c $-\frac{\pi}{2}$

d ∞

e $-\infty$

f none of them

C

$$\lim_{x \to \infty} \sin x =$$

a 1

b -1

c does not exist

d none of them

C

$$\lim_{x \to \infty} \frac{2x^3 + x^2 + 4}{x^2 - x + 2} =$$

a	∞
b	2
c	0
d	none of them

C

$$\lim_{x \to 0^+} \frac{e^{1/x}(x-1)}{x}$$

a	0
b	1
c	e
d	∞
e	-1
f	$-e$
g	$-\infty$
h	none of them

D

$$\left(\frac{1}{\sqrt[3]{x}}\right)' =$$

a $\frac{1}{3}x^{-2/3}$

b $-\frac{1}{3}x^{-2/3}$

c $-\frac{1}{3}x^{1/3}$

d $\frac{1}{3}x^{-4/3}$

e $-\frac{1}{3}x^{-4/3}$

f none of them

D

$(x - x \ln x)' =$

a $\ln x$

b $-\ln x$

c $1 + \ln x$

d $1 - \ln x$

e 0

f $1 - \frac{1}{x}$

g none of them

D

$$\left(x^2 e^{x^2}\right)'$$

a	$2xe^{2x}$
b	$2xe^{x^2}2x$
c	$2xe^{x^2} + x^2 e^{x^2}$
d	$2xe^{x^2} + x^2 e^{x^2}2x$
e	$2xe^{x^2}2x + x^2 e^{x^2}2x$
f	none of them

D

The definition of the derivative of the function f at the point a is

a $\lim_{h\to 0} \dfrac{f(x+h)+f(x)}{h}$

b $\lim_{h\to 0} \dfrac{f(x+h)}{h}$

c $\lim_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$

d $\lim_{h\to 0} \dfrac{f(x)-f(x+h)}{h}$

e $\lim_{h\to 0} \dfrac{f(x-h)-f(x)}{h}$

f none of them

E

$(x^2 + 1)' =$ 

E

$(xe^x)' =$ 

E

$$\ln(\sin x) = \boxed{}$$

E

$(xe^{-x})' =$ 

F

By theorem of Bolzano, the polynomial $y = x^3 + 2x + 4$ has zero on

a $(0, 1)$

b $(1, 2)$

c $(2, 3)$

d $(-1, 0)$

e $(-2, -1)$

f $(-3, -2)$

g none of them

F

Let $a \in Im(f)$. Then the solution of the equation $f(x) = a$ exists. This solution is unique if and only if

a f is one-to-one

b f is increasing

c f continuous

d f differentiable

e none of them

F

If the function has a derivative at the point $x = a$, then it is

a increasing at a.

b decreasing at a.

c one-to-one at a.

d continuous at a.

e undefined at a.

F

If both $y(a) = y'(a) = y''(a) = 0$, then the function

a has local maximum at a.

b has local minimum at a.

c has point of inflection at a.

d any of these possibilites may be true, we need more informations.