

专题 08 函数图像的判断

一、考向解读

考向：函数图像是研究函数性质、方程、不等式的重要方法，是高考命题的一个热点。在高考中经常以几类初等函数的图像为基础，结合函数的性质综合考查，多以选择题的形式出现。

考点：函数图像的判断

导师建议：函数图像判断常规步骤：**判断奇偶性**→**代特殊值**→**极限思想**

二、知识点汇总

奇偶性	定义	图象特点
偶函数	如果对于函数 $f(x)$ 的定义域内任意一个 x ，都有 $f(-x) = f(x)$ ，那么函数 $f(x)$ 是偶函数	图象关于 y 轴对称
奇函数	如果对于函数 $f(x)$ 的定义域内任意一个 x ，都有 $f(-x) = -f(x)$ ，那么函数 $f(x)$ 是奇函数	图象关于原点对称

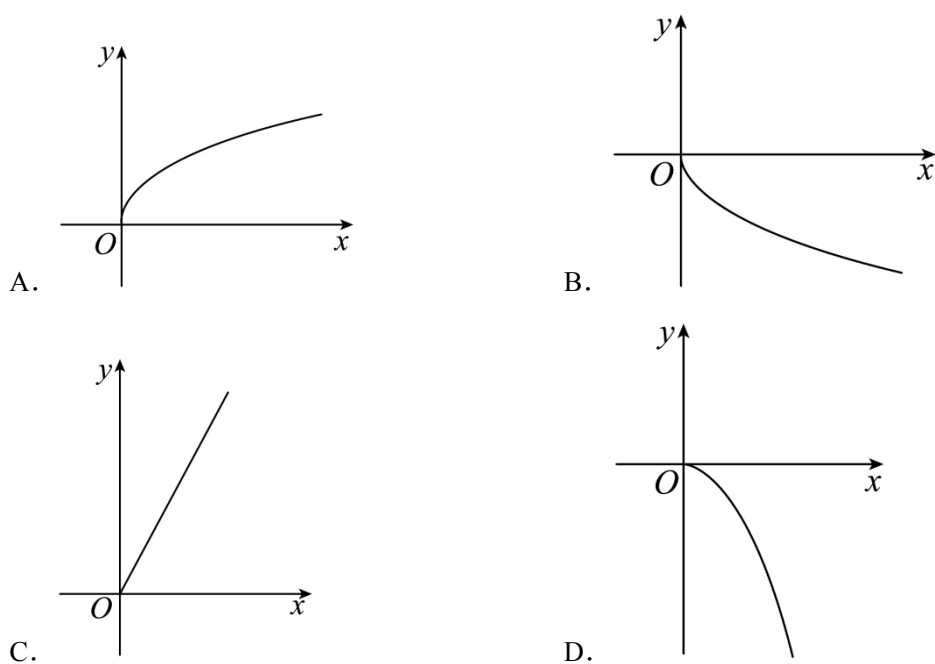
【常用结论】

- ①利用奇偶性或对称性，奇函数关于原点对称，偶函数关于 y 轴对称。
- ②利用单调性，可以是整个定义域中的单调性，也可以是某个小区间或某一点附近的单调性。
- ③利用某些点处的函数值的符号或大小关系等，一些不在函数图像上点的极限，比如 x 趋近于正无穷或开区间端点时的函数值。

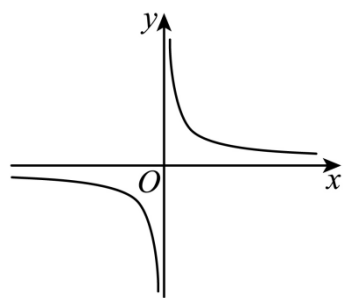
三、题型专项训练

①幂函数

1. 函数 $y = \sqrt{x}$ 的图像大致为 ()

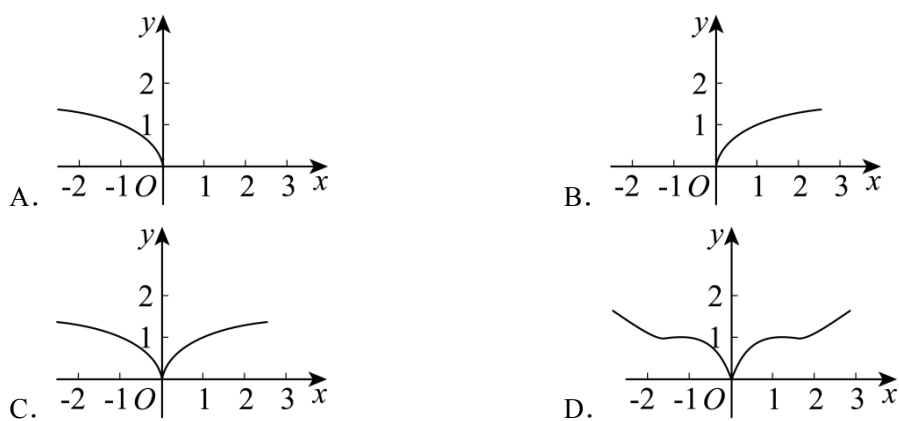


2. 下列函数中，其图像如图所示的函数为（ ）

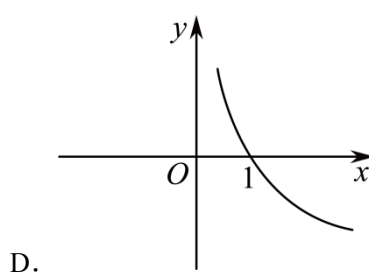
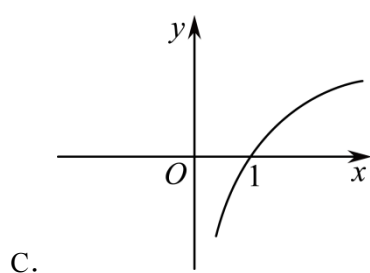
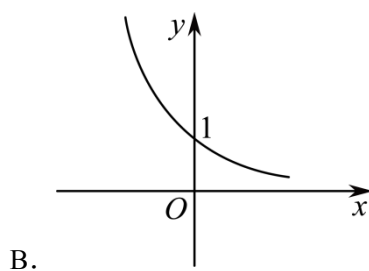
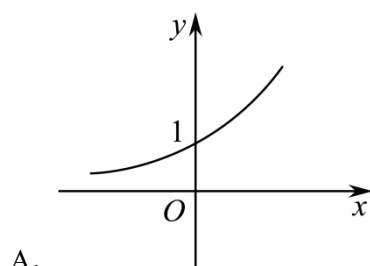


- A. $y = x^{\frac{1}{3}}$ B. $y = x^{\frac{2}{3}}$ C. $y = x^{\frac{1}{3}}$ D. $y = x^{-\frac{2}{3}}$

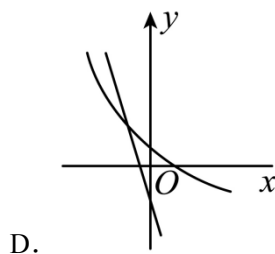
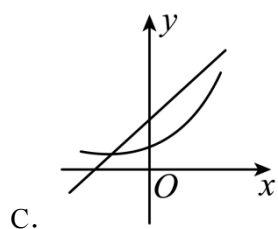
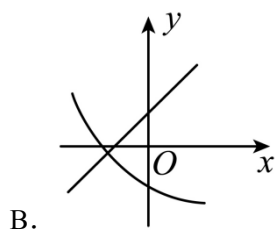
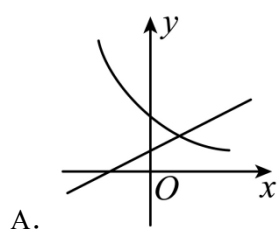
3. 函数 $f(x) = \sqrt{|x|}$ 的图象大致为（ ）



4. 函数 $y=5^{-x}$ 的图象是 ()

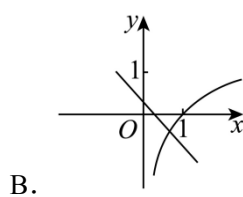
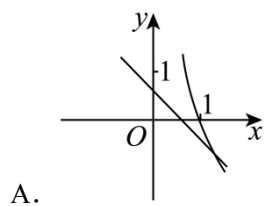


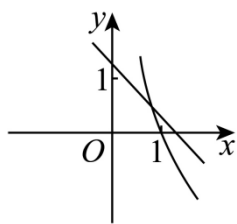
5. 函数 $y=ax+b$ ($a>0$ 且 $a\neq 1$) 与函数 $y=a^x+b$ 的图象可能是 ()



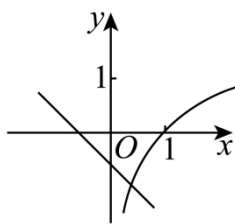
③对数函数

6. 在同一直角坐标系中的函数 $y=\log_a x$ 与 $y=-x+a$ 的图象可能是 ()



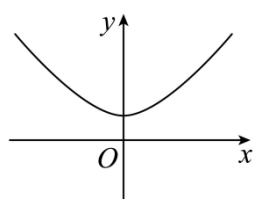


C.

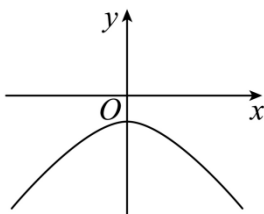


D.

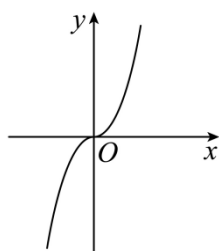
7. 函数 $f(x) = \log_2(4^x + 1) - x$ 的部分图像大致为 ()



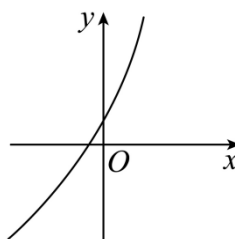
A.



B.

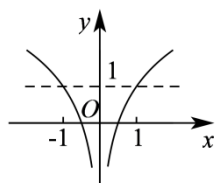


C.

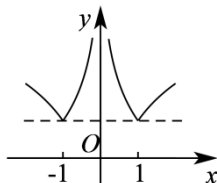


D.

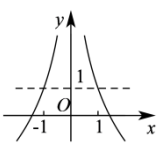
8. 函数 $f(x) = \log_a|x| + 1$ ($a > 1$) 的图象大致为 ()



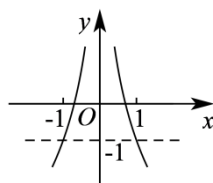
A.



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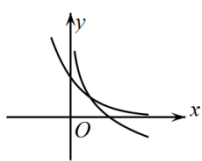
C.



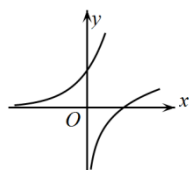
D.

④指数函数与对数函数综合

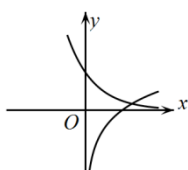
9. 函数 $f(x) = \left(\frac{1}{4}\right)^x$ 与 $g(x) = -\log_4 x$ 的大致图像是 ()



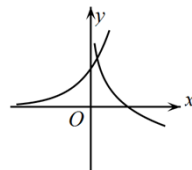
A.



B.



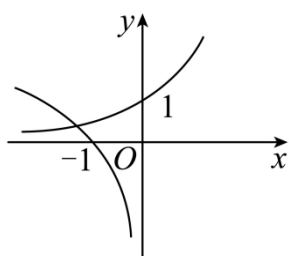
C.



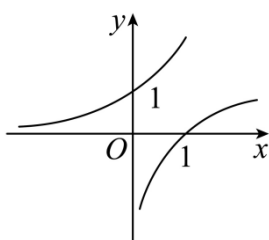
D.

10. 已知 $\lg a + \lg b = 0$ ($a > 0$ 且 $a \neq 1$, $b > 0$ 且 $b \neq 1$), 则函数 $f(x) = a^x$ 与 $g(x) = \log_{\frac{1}{b}} x$

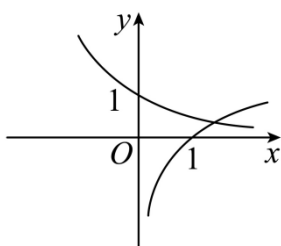
的图象可能是 ()



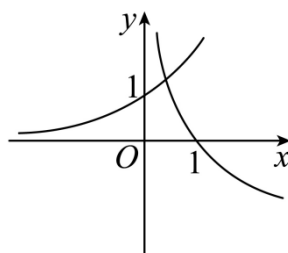
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B.



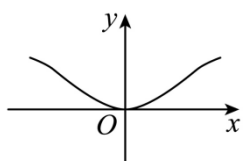
C.



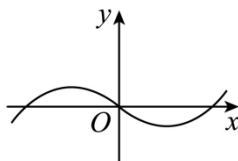
D.

⑤三角函数

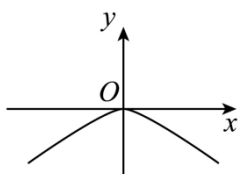
11. 函数 $f(x) = \frac{10^x - 1}{10^x + 1} \cdot \sin x$ 在区间 $[-\frac{\pi}{2}, \frac{\pi}{2}]$ 上的图象大致为 ()



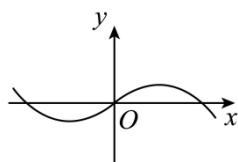
A.



B.

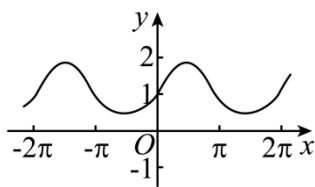


C.

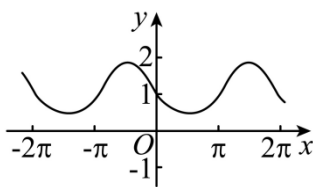


D.

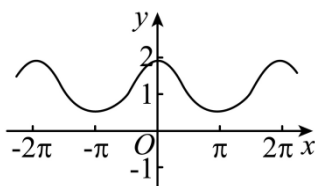
12. 函数 $f(x) = 2^{\sin x}$ 的大致图像是 ()



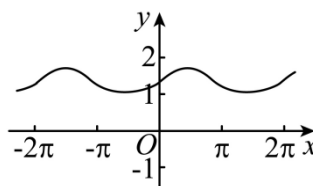
A.



B.

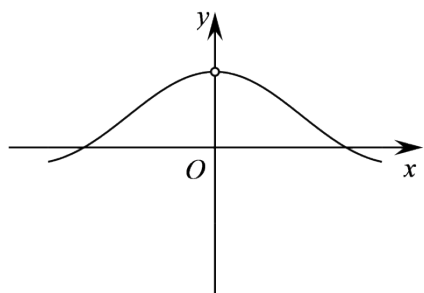


C.

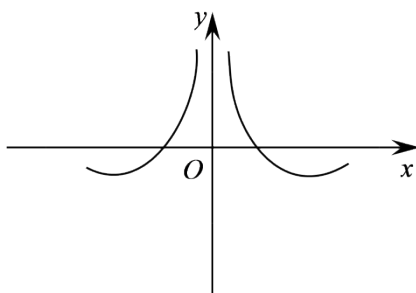


D.

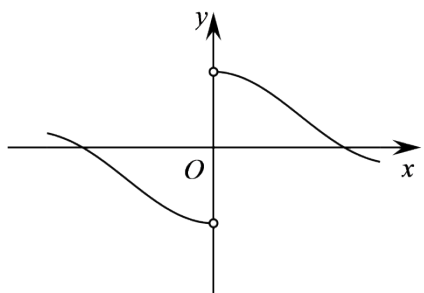
13. 函数 $f(x) = \frac{\cos(x - \frac{\pi}{2})}{|x|}$ 的部分图像大致是 ()



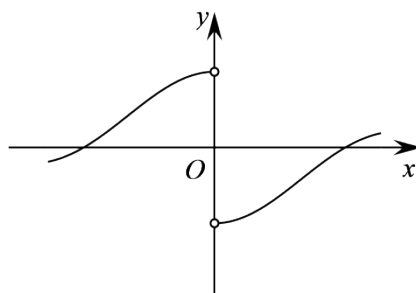
A.



B.

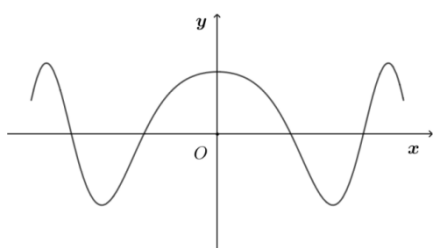


C.

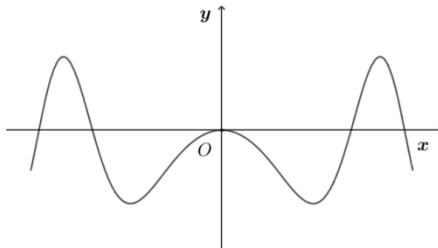


D.

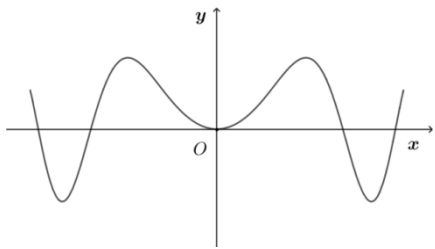
14. 已知 $a \in \mathbf{R}$, 则函数 $f(x) = \cos|x^2 - a|$ 的图像不可能是 ()



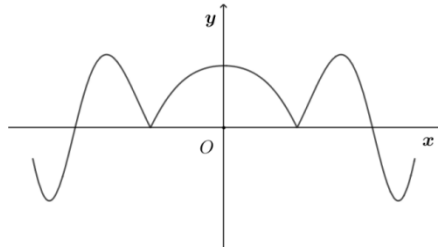
A.



B.

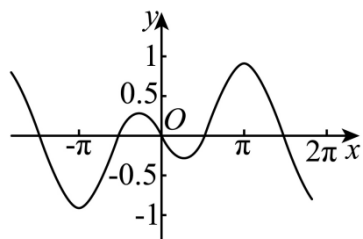


C.

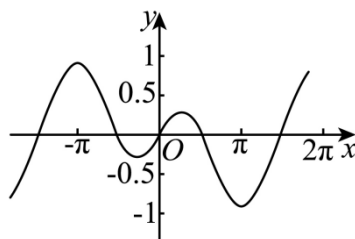


D.

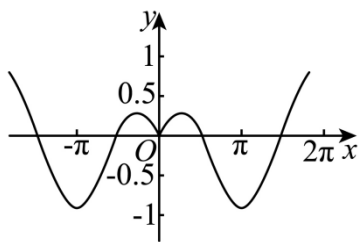
15. 函数 $f(x) = \frac{e^x - 1}{e^x + 1} \sin\left(\frac{\pi}{2} - x\right)$ 的图像大致为 ()



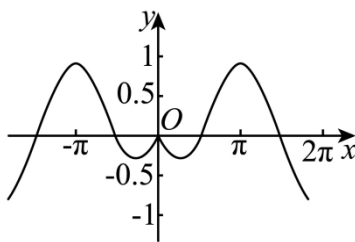
A.



B.



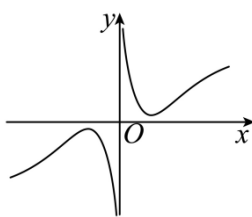
C.



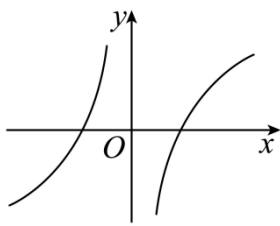
D.

⑤综合型函数

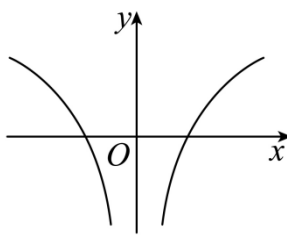
16. 函数 $f(x) = \ln\left(x - \frac{1}{x}\right)$ 的图象可能是 ().



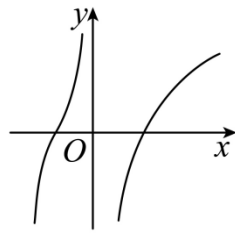
A.



B.

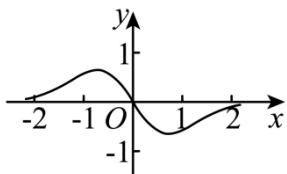


C.

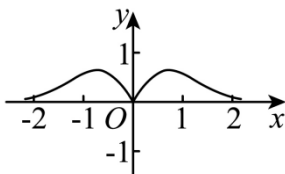


D.

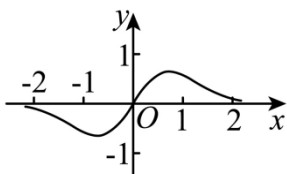
17. 函数 $y = \frac{x - 3\sin x}{|x|}$ 的大致图象是 ().



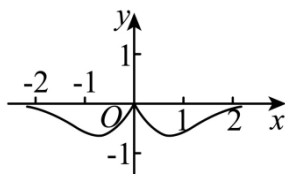
A.



B.

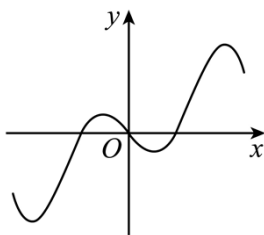


C.

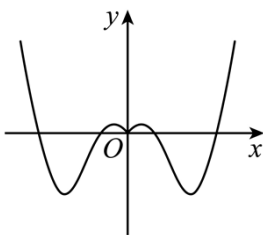


D.

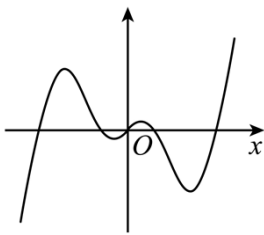
18. 函数 $f(x) = x \cos x$ 的部分图象大致为 ().



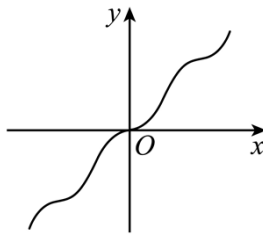
A.



B.

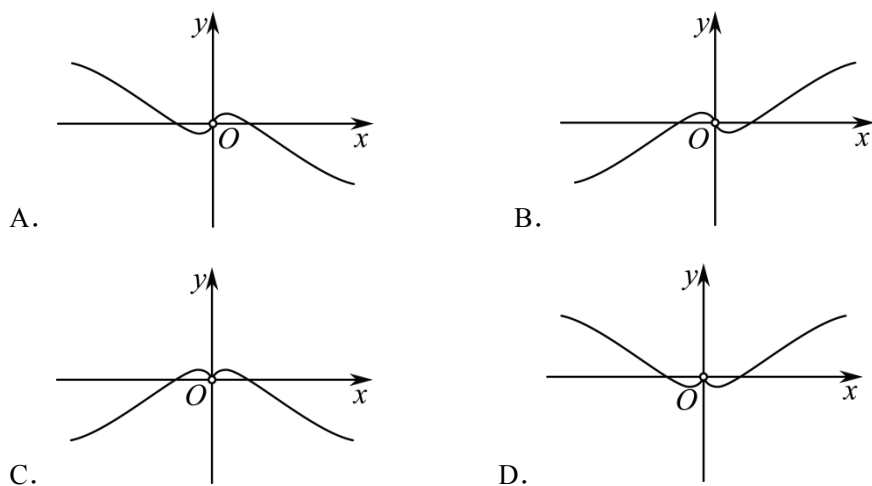


C.



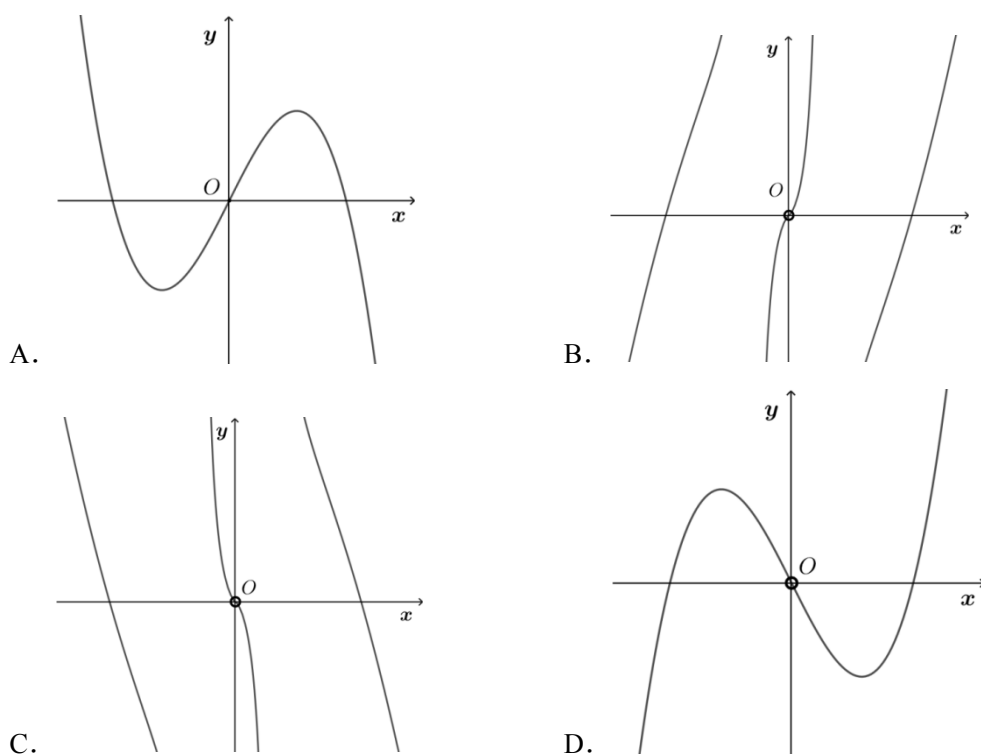
D.

19. 函数 $f(x) = \left(\frac{1}{3^x + 1} - \frac{1}{2}\right) \ln|x|$ 的图象大致是 ().

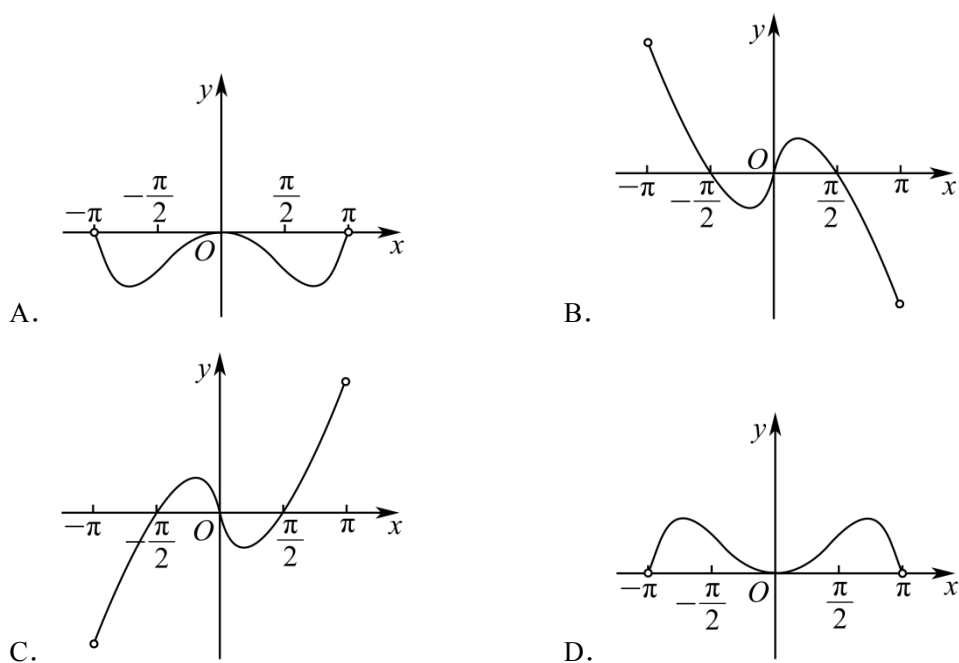


20. 我国著名数学家华罗庚先生曾说：数缺形时少直观，形缺数时难入微，数形结合百般好，隔离分家万事休。在数学的学习和研究中我们常用函数的图象来研究函数的性质，也常用函数的解析式来琢磨函数的

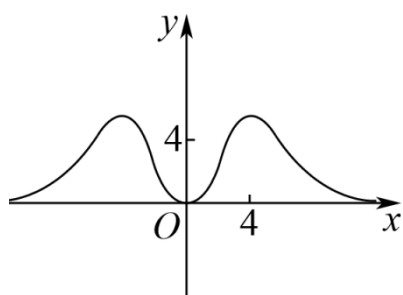
图象的特征。函数 $f(x) = \frac{x^3 - 3x}{\ln|e^x - e^{-x}|}$ 的部分图象大致为 ()



21. 我国著名数学家华罗庚先生曾说：数缺形时少直观，形缺数时难入微，数形结合百般好，隔离分家万事休。在数学的学习和研究中，函数的解析式常用来琢磨函数的图象的特征。函数 $f(x) = \cos x \ln \frac{\pi - x}{\pi + x}$ 的图象大致为 ()



22. 已知函数 $f(x)$ 的图象如图所示, 则 $f(x)$ 的解析式可以为 ()



A. $f(x) = \frac{x^4}{e^x + e^{-x}}$

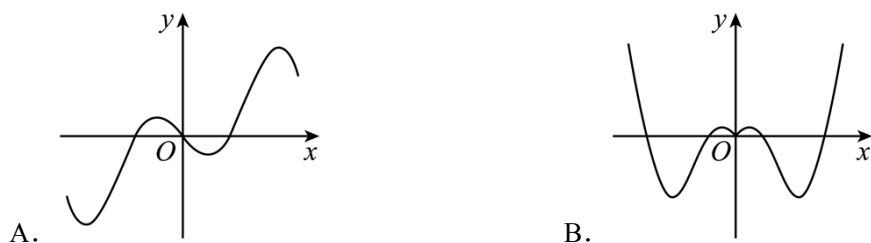
B. $f(x) = \frac{x^3}{e^x + e^{-x}}$

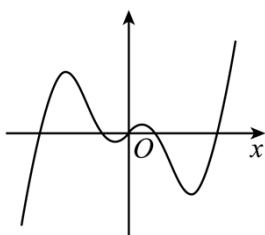
C. $f(x) = \frac{x^2}{e^x + e^{-x}}$

D. $f(x) = \frac{x^4}{e^x - e^{-x}}$

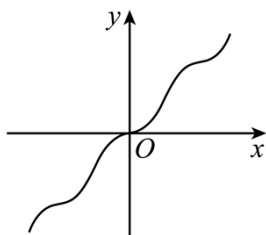
四、高考真题及模拟题精选

1. (2023·江西上饶·统考一模) 函数 $f(x) = x \cos x$ 的部分图象大致为 ()



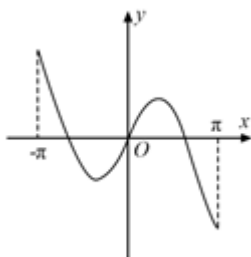


C.

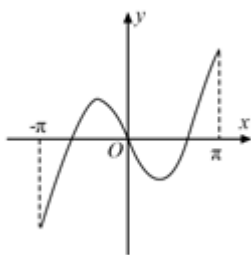


D.

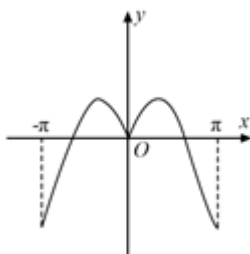
2. (2020·浙江·统考高考真题) 函数 $y=x\cos x+\sin x$ 在区间 $[-\pi, \pi]$ 的图象大致为 ()



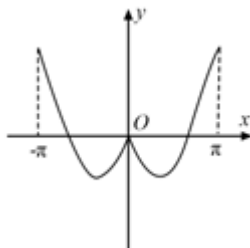
A.



B.

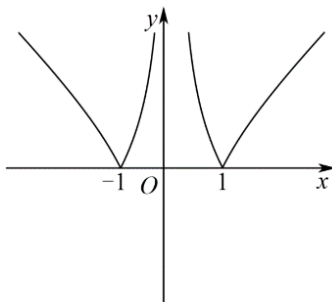


C.

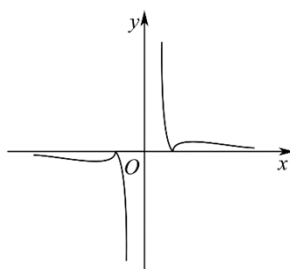


D.

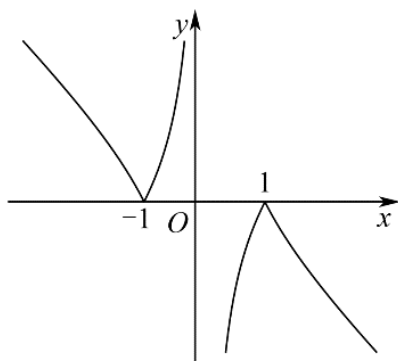
3. (2022·天津·统考高考真题) 函数 $f(x)=\frac{|x^2-1|}{x}$ 的图像为 ()



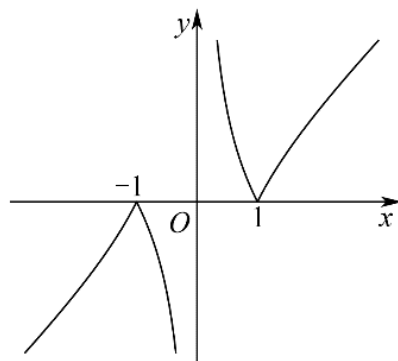
A.



B.



C.



D.

4. (2020·天津·统考高考真题) 函数 $y=\frac{4x}{x^2+1}$ 的图象大致为 ()

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：<https://d.book118.com/838124110020006063>