

函数比大小与函数图像 (小题)

一、函数类小题

比大小

1 若 $a = \ln \frac{1}{2}$, $b = \left(\frac{1}{3}\right)^{0.8}$, $c = 2^{\frac{1}{3}}$, 则 () .

A. $a < c < b$

B. $a < b < c$

C. $c < a < b$

D. $b < a < c$

2 已知 $a = 2^{1.2}$, $b = \left(\frac{1}{2}\right)^{-0.8}$, $c = 2\log_5 2$, 则 a, b, c 的大小关系为 () .

A. $c < b < a$

B. $c < a < b$

C. $b < a < c$

D. $b < c < a$

3 已知 $f(x)$ 是定义在 $\mathbf{R}$ 上的偶函数, 且 $f(x)$ 在 $(0, +\infty)$ 内单调递减, 则 () .

A. $f(0) < f(\log_3 2) < f(-\log_2 3)$

B. $f(\log_3 2) < f(0) < f(-\log_2 3)$

C. $f(-\log_2 3) < f(\log_3 2) < f(0)$

D. $f(\log_3 2) < f(-\log_2 3) < f(0)$

4 已知 $a = 5^{\log_2 3.4}$, $b = 5^{\log_4 3.6}$, $c = \left(\frac{1}{5}\right)^{\log_3 0.3}$, 则 () .

A. $a > b > c$

B. $b > a > c$

C. $a > c > b$

D. $c > a > b$

5 已知 $a = \log_3 \frac{7}{2}$, $b = \left(\frac{1}{4}\right)^{\frac{1}{3}}$, $c = \log_{\frac{1}{3}} \frac{1}{5}$, 则 a, b, c 的大小关系为 () .

A. $a > b > c$

B. $b > a > c$

C. $c > b > a$

D. $c > a > b$

6 已知奇函数 $f(x)$ 在 $\mathbf{R}$ 上是增函数, 设 $a = 3^{0.3} \cdot f(3^{0.3})$, $b = (\log_{\pi} 3) \cdot f(\log_{\pi} 3)$, $c = \left(\log_3 \frac{1}{9}\right) \cdot f\left(\log_3 \frac{1}{9}\right)$, 则 a, b, c 之间的大小关系为 () .

- A. $b < a < c$ B. $a < b < c$ C. $c < a < b$ D. $b < c < a$

7 已知, $f(x) = 2^x - 2^{-x}$, $a = \left(\frac{7}{9}\right)^{-\frac{1}{2}}$, $b = \left(\frac{7}{9}\right)^{\frac{1}{3}}$, $c = \log_2 \frac{7}{9}$ 则 $f(a), f(b), f(c)$ 的大小顺序为 () .

- A. $f(b) < f(a) < f(c)$
B. $f(c) < f(b) < f(a)$
C. $f(c) < f(a) < f(b)$
D. $f(b) < f(c) < f(a)$

8 已知函数 $f(x)$ 是定义在区间 $[1 - 3m, 2m]$ 上的偶函数, 且当 $x \in (0, +\infty)$ 时, $f(x)$ 单调递增, 若 $a = f(m)$, $b = f(2^{-0.4})$, $c = f\left(\log_4 \frac{1}{5}\right)$, 则 a, b, c 的大小关系是 () .

- A. $a > c > b$ B. $a > b > c$ C. $b > c > a$ D. $c > a > b$

9 已知 $a = \log_5 6$, $b = \ln 0.5$, $c = 0.6^{0.5}$, 则 () .

- A. $a > b > c$ B. $a > c > b$ C. $c > a > b$ D. $c > b > a$

10 若 $0 < x < y < 1$, 则下列结论正确的是 () .

- A. $3^x > 3^y$ B. $\left(\frac{1}{3}\right)^x < \left(\frac{1}{3}\right)^y$ C. $\log_{1.3} x < \log_{1.3} y$ D. $\log_{0.3} x < \log_{0.3} y$

11 已知 $a = \sqrt{2^{\frac{4}{3}}}$, $b = 2^{\frac{2}{5}}$, $c = \log_5 4$, 则 a, b, c 的大小关系为 () .

- A. $c < b < a$ B. $c < a < b$ C. $b < a < c$ D. $b < c < a$

12 已知定义在 $\mathbf{R}$ 上的函数 $f(x-1)$ 的图像关于 $x=1$ 对称, 且当 $x>0$ 时, $f(x)$ 单调递减, 若

$a = f(\log_{0.5} 3)$, $b = f(0.5^{-1.3})$, $c = f(0.7^6)$, 则 a, b, c 的大小关系是().

- A. $c > a > b$ B. $b > a > c$ C. $a > c > b$ D. $c > b > a$

13 已知 $f(x) = |2^x - 1|$, 当 $a < b < c$ 时, 有 $f(a) > f(c) > f(b)$, 则必有().

- A. $a < 0, b < 0, c < 0$ B. $a < 0, b > 0, c > 0$
C. $2^{-a} < 2^c$ D. $1 < 2^a + 2^c < 2$

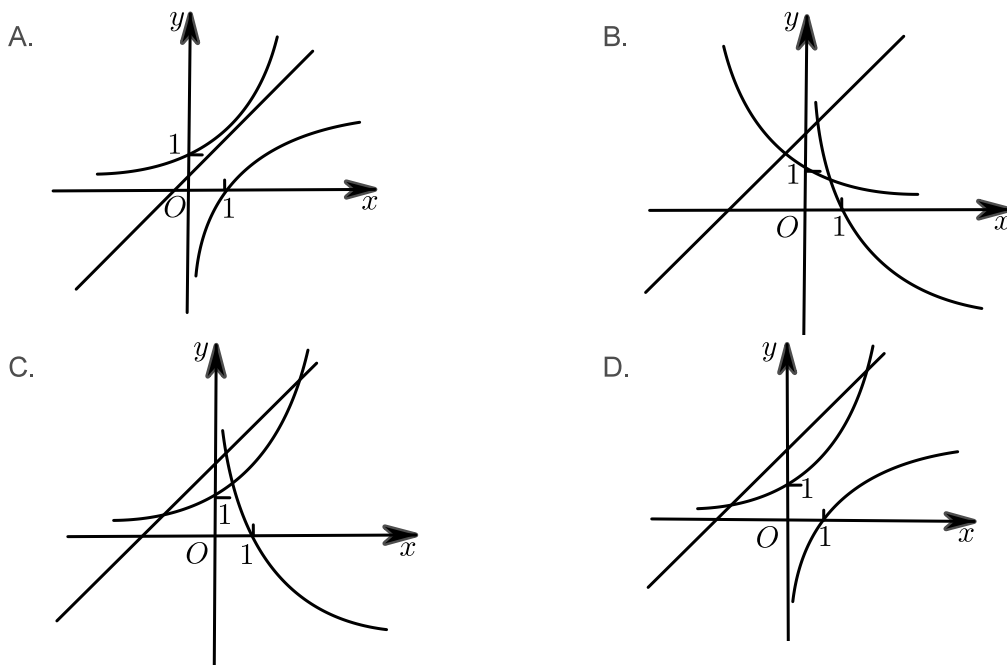
14 已知 $f(x) = 2^x + 2^{-x}$, $f(m) = 3$, 且 $m > 0$, 若 $a = f(2m)$, $b = 2f(m)$, $c = f(m+2)$, 则 a, b, c 的大小关系为().

- A. $c < b < a$ B. $a < c < b$ C. $a < b < c$ D. $b < a < c$



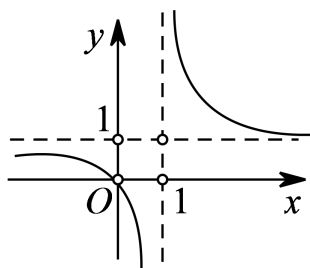
图像

15 在同一坐标系中画出函数 $y = \log_a x$, $y = a^x$, $y = x + a$ 的图象, 可能正确的是().

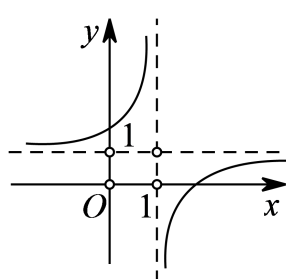


16 函数 $y = 1 - \frac{1}{x-1}$ 的图象是 () .

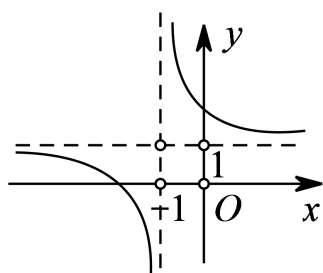
A.



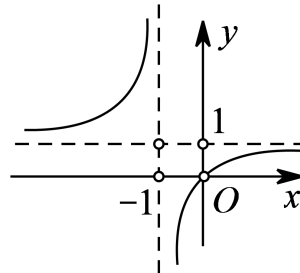
B.



C.

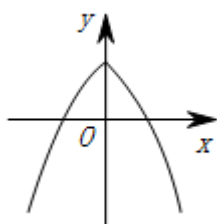


D.

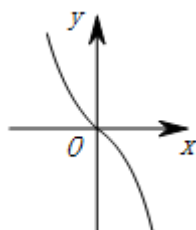


17 函数 $f(x) = 1 - 2^{|x|}$ 的图象大致是 () .

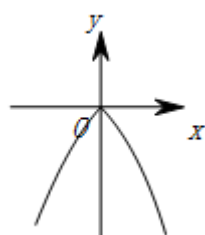
A.



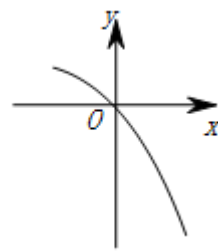
B.



C.

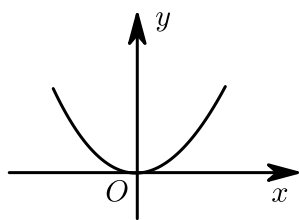


D.

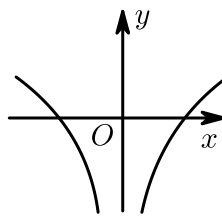


18 函数 $f(x) = \ln(x^2 + 1)$ 的图象大致是 () .

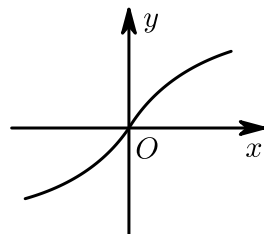
A.



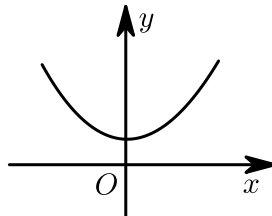
B.



C.

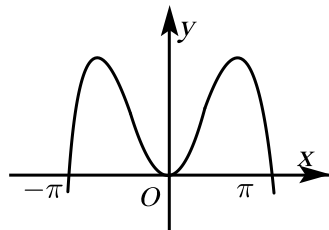


D.

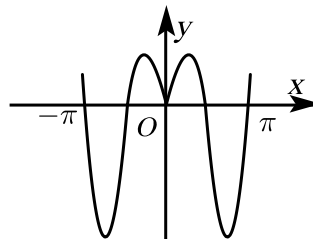


19 函数 $y = 2^{|x|} \sin 2x$ 的图象可能是 () .

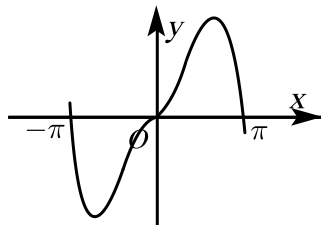
A.



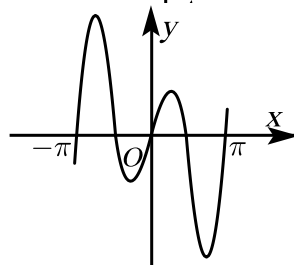
B.



C.

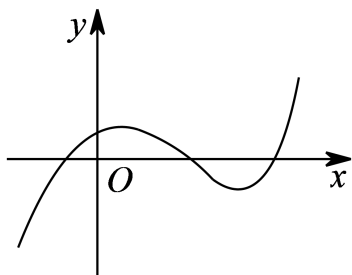


D.

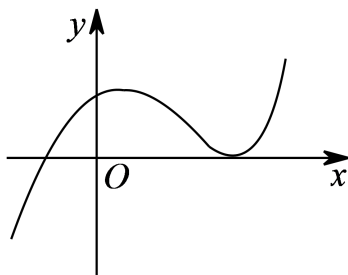


20 函数 $y = 2^x - x^2$ 的图像大致是 () .

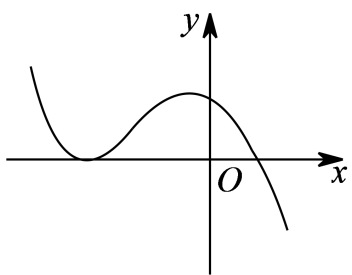
A.



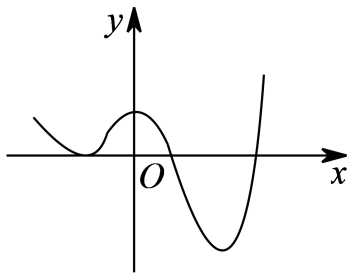
B.



C.

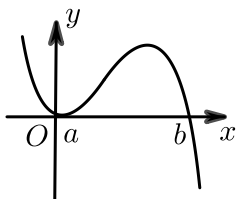


D.

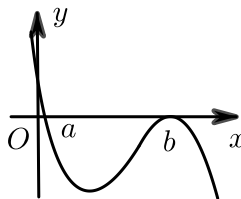


21 设 $a < b$, 函数 $y = (x - a)^2 (x - b)$ 的图像可能是 () .

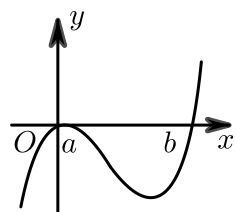
A.



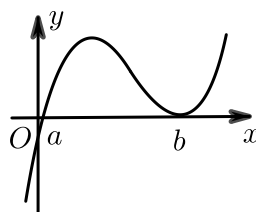
B.



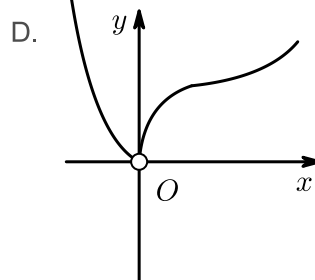
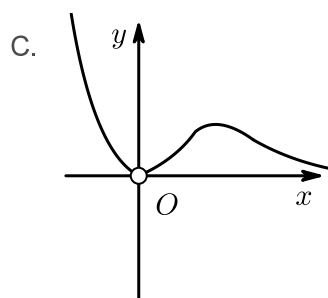
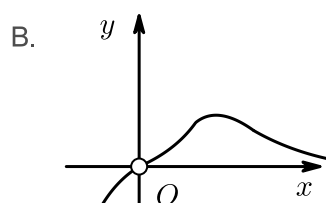
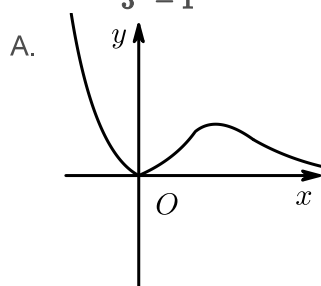
C.



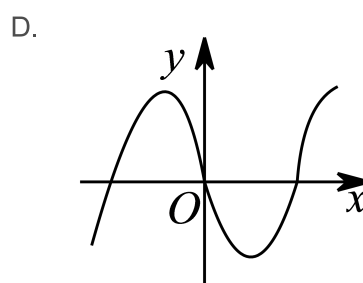
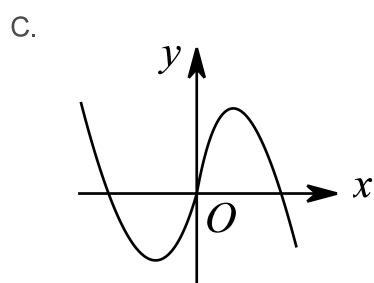
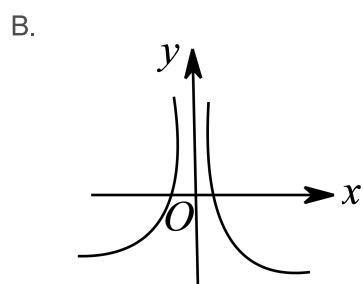
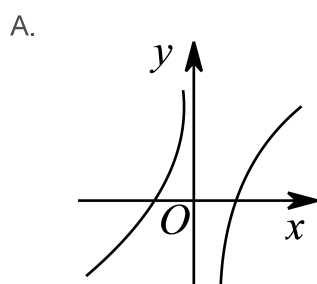
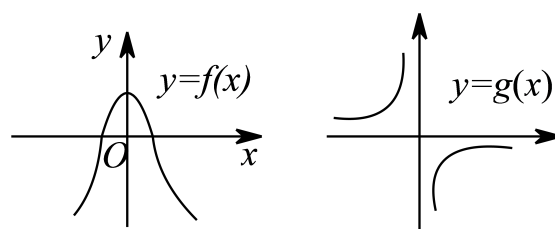
D.



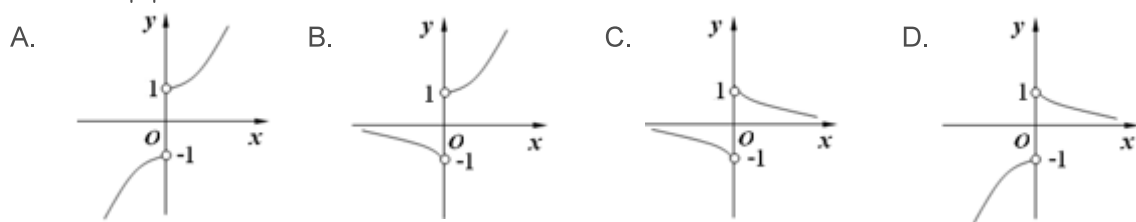
22 函数 $y = \frac{x^3}{3^x - 1}$ 的图象大致是 () .



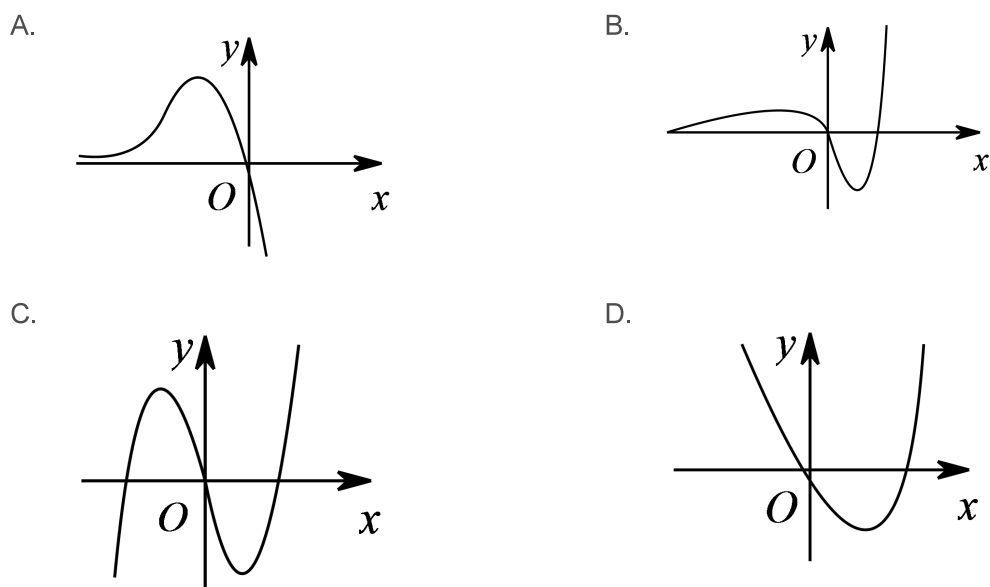
23 函数 $y = f(x)$ 与 $y = g(x)$ 的图像如下图：则函数 $y = f(x) \cdot g(x)$ 的图像可能是 () .



24 函数 $y = \frac{xa^x}{|x|}$ ($0 < a < 1$) 的图象的大致形状是 () .



25 函数 $f(x) = (x^2 - 2x)e^x$ 的图象大致是 () .



二、限时训练

本部分共9个选择题，限时25分钟.

26 设集合 $S = \{x | x > -2\}$, $T = \{x | x^2 + 3x - 4 \leq 0\}$, 则 $(\complement_{\mathbb{R}} S) \cup T = (\quad)$.

- A. $(-2, 1]$ B. $(-\infty, -4]$ C. $(-\infty, 1]$ D. $[1, +\infty)$

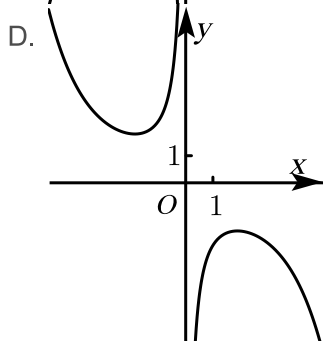
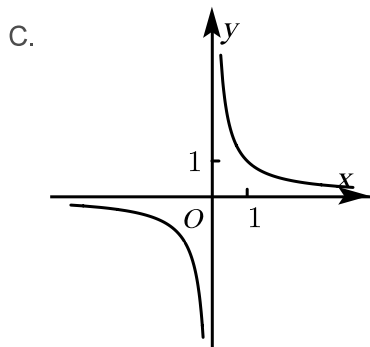
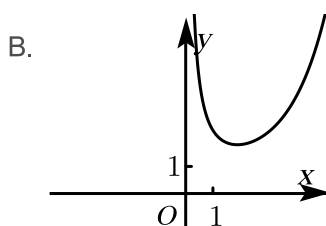
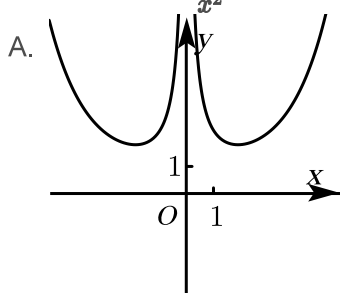
27 命题“ $\forall n \in \mathbb{N}^*$, $f(n) \in \mathbb{N}^*$ 且 $f(n) \leq n$ ”的否定形式是 () .

- A. $\forall n \in \mathbb{N}^*$, $f(n) \notin \mathbb{N}^*$ 且 $f(n) > n$
 B. $\forall n \in \mathbb{N}^*$, $f(n) \notin \mathbb{N}^*$ 或 $f(n) > n$
 C. $\exists n_0 \in \mathbb{N}^*$, $f(n_0) \notin \mathbb{N}^*$ 且 $f(n_0) > n_0$
 D. $\exists n_0 \in \mathbb{N}^*$, $f(n_0) \notin \mathbb{N}^*$ 或 $f(n_0) > n_0$

28 若样本数据 $x_1, x_2, \dots, x_{10}$ 的标准差为8, 则数据 $2x_1 - 1, 2x_2 - 1, \dots, 2x_{10} - 1$ 的标准差为 () .

- A. 8 B. 15 C. 16 D. 32

29 函数 $f(x) = \frac{e^x - e^{-x}}{x^2}$ 的图象大致为 () .



A. $(0, 1)$
B. $(1, 2)$
C. $(2, 3)$
D. $(3, 4)$

A. $a^2 + b^2 > 2ab$

B. $a + b \geq 2\sqrt{ab}$

C. $\frac{1}{a} + \frac{1}{b} > \frac{2}{\sqrt{ab}}$

D. $\frac{b}{a} + \frac{a}{b} \geq 2$

A. $\frac{\pi}{6}$ B. $\frac{\pi}{4}$ C. $\frac{\pi}{3}$ D. $\frac{\pi}{2}$

A. $\frac{3}{4}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{4}$

A. $\omega = \frac{2}{3}$, $\varphi = \frac{\pi}{12}$
 B. $\omega = \frac{2}{3}$, $\varphi = -\frac{11\pi}{12}$
 C. $\omega = \frac{1}{3}$, $\varphi = -\frac{11\pi}{24}$
 D. $\omega = \frac{1}{3}$, $\varphi = \frac{7\pi}{24}$