

# 1-4 小考解析

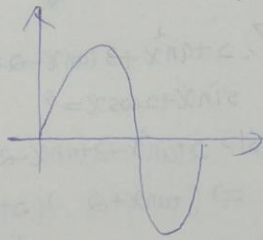
小考1-4. 解析.

1.  $\because$  函数图形在格  $\frac{\pi}{4}$  单位.

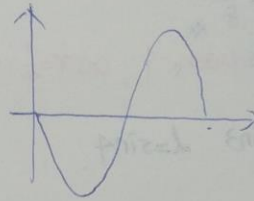
$\therefore$  图形为  $y = \sin(x - \frac{\pi}{4})$  \*

故选(B)

2. 原  $\sin x$  图形为



但图形为



$\therefore a < 0$

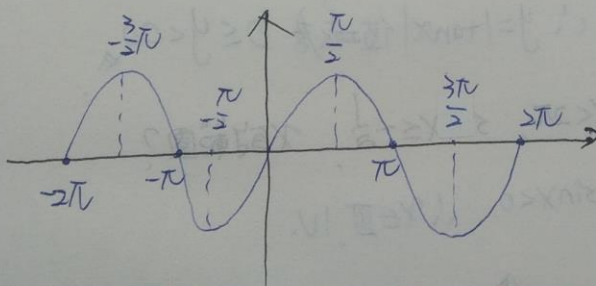
$\because$  原值域为  $-1 \leq \sin x \leq 1 \rightarrow -3 \leq \sin x \leq 3$

$\therefore |a| = 3 \therefore a = -3$

$\because$  周期为  $\pi \therefore T = 2\pi \Rightarrow r\pi = 2\pi \therefore r = 2 \Rightarrow b = 2$

$\therefore y = a \sin(bx) = -3 \sin 2x$  \* 故选(E)

3.  $\sin$  函数在  $-2\pi \sim 2\pi$  的图形如下:



图形每  $\frac{n\pi}{2}$  会对称一次, 其中  $n \in \mathbb{Z}$  (整数).

$n=0$  对称于原点.

$n=1$  对称于  $x = \frac{\pi}{2}$ .

$n=-5$  对称于  $x = -\frac{5}{2}\pi$ .

故选 C.D.E \*

4.  $0 \leq x < \pi$ .

$y = 2\sin^2 x + \cos x$  最大值.

$\langle \text{sol} \rangle \quad y = 2(1 - \cos^2 x) + \cos x$   
 $= 2 - 2\cos^2 x + \cos x$   
 $= -2\cos^2 x + \cos x + 2$   
 $= -2(\cos x - \frac{1}{4})^2 + 2 + \frac{1}{8}$   
 $= -2(\cos x - \frac{1}{4})^2 + \frac{17}{8}$

$\cos x = \frac{1}{4}$ .  $\text{Max} = \frac{17}{8}$

Note:  $0 \leq x < \pi \Rightarrow -1 < \cos x \leq 1$ ,  $\cos x = \frac{1}{4}$  (合)

6.  $a = \sin 1$   $b = \sin 2$   $c = \sin 3$   $d = \sin 4$ .

$|1| = \frac{180^\circ}{\pi} \approx 57^\circ$

$\therefore a = \sin 1 = \sin 57^\circ$

$b = \sin 2 = \sin 114^\circ = \sin(90^\circ \times 2 - 66^\circ) = \sin 66^\circ$

$c = \sin 3 = \sin 171^\circ = \sin(90^\circ \times 2 - 9^\circ) = \sin 9^\circ$

$d = \sin 4 = \sin 228^\circ = \sin(90^\circ \times 2 + 48^\circ) = -\sin 48^\circ$

$\therefore -\sin 48^\circ < \sin 9^\circ < \sin 57^\circ < \sin 66^\circ$

$\therefore d < c < a < b$

8.  $0 \leq x < \pi$ .  $y = \cos x - 4$  的值域.

$\langle \text{sol} \rangle$

$\therefore 0 \leq x < \pi$

$\therefore -1 < \cos x \leq 1$

$\therefore -1 - 4 < \cos x \leq 1 - 4$

$\therefore -5 < \cos x \leq -3$

5.  $y = -4\sin(-3x - 2) + 6$ .

上4. 左2. 得  $y'$  的周期

$\langle \text{sol} \rangle$  Note: 平衡周期不变  $y' = -4\sin(-3x) + 10$

$\therefore T = 2\pi$

$\therefore T = \frac{2}{3}\pi$

7.  $2\tan^2 x + 3\tan x - 2 > 0$ .  $\sin x < 0$ .  $\cos x < 0$ .

$\sin x + 2\cos x = ?$

$\langle \text{sol} \rangle \quad 2\tan^2 x + 3\tan x - 2 = 0$

$\Rightarrow (\tan x + 2)(2\tan x - 1) = 0$

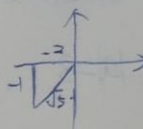
$\therefore \tan x = -2$  或  $\frac{1}{2}$

$\therefore \sin x < 0$ .  $\cos x < 0$ .  $\therefore x \in \text{III}$

$\therefore \tan x = \frac{1}{2} > 0$

$\therefore \sin x = \frac{-1}{\sqrt{5}}$   $\cos x = \frac{-2}{\sqrt{5}}$

$\therefore \sin x + 2\cos x = \frac{-1}{\sqrt{5}} + \frac{(-2) \times 2}{\sqrt{5}} = \frac{-5}{\sqrt{5}} = -\sqrt{5}$



9.  $y = |\tan x|$  值域

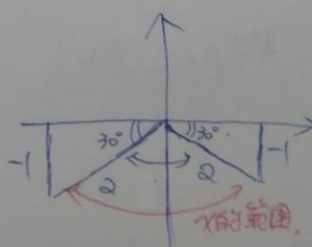
$\langle \text{sol} \rangle \quad y = \tan x$  的值域为  $-\infty < y < \infty$ .

$\therefore |\tan x| > 0$

$\therefore y = |\tan x|$  值域为  $0 \leq y < \infty$

10.  $0 \leq x < 2\pi$ .  $\sin x \leq -\frac{1}{2}$ .  $x$  的范围?

$\langle \text{sol} \rangle \quad \therefore \sin x < 0$ .  $\therefore x \in \text{III, IV}$ .



$\pi = 180^\circ \Rightarrow \frac{\pi}{6} \Rightarrow 30^\circ$

$\therefore 210^\circ = \frac{7}{6}\pi$

$330^\circ = \frac{11}{6}\pi$

$\therefore \frac{7}{6}\pi \leq x \leq \frac{11}{6}\pi$