

泉州七中 2018 级高二下数学周练 2 (命卷人: 吴秋生)

号: 名:

一、选择题 (每小题10分, 共60分)

1.  $f(x) = |\sin x \cdot \cos x|$  ( )

- A.  $\pi$  B.  $2\pi$  C.  $4\pi$  D.  $8\pi$

2. (2019 三)  $\sin \alpha < 0$ , 下三 ( )

- A.  $\cos \alpha$  B.  $\tan \alpha$  C.  $\cos^2 \alpha$  D.  $\tan^2 \alpha$

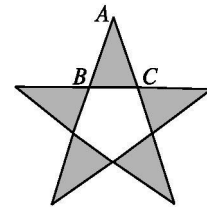
3.  $a \in (1, 2)$  与  $y = x^4$  (1,1),  $\cos^2 \alpha - \sin 2\alpha$  ( )

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

4. (2019 三)  $\sin 36^\circ = \frac{1}{2} (\sqrt{5} - 1)$ ,  $\sin 108^\circ = \frac{1}{2} (\sqrt{5} + 1)$

$\sin 234^\circ = \sin(180^\circ + 54^\circ) = -\sin 54^\circ = -\cos 36^\circ = -\frac{1}{2} (\sqrt{5} - 1)$

- A.  $\frac{\sqrt{5}-1}{4}$  B.  $-\frac{\sqrt{5}-1}{4}$  C.  $-\frac{\sqrt{5}+1}{4}$  D.  $-\frac{\sqrt{5}+1}{2}$



5. (2019 三)  $f(x) = \sin(\omega x - \frac{\pi}{6})$  ( $\omega > 0$ ),  $f(x) \leq f(-x)$  恒成立,  $\omega$  的最小值为 ( )

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

6. ( )  $\triangle ABC$ , 下三 ( )

- A.  $\sin 2A = \sin 2B$ ,  $\triangle ABC$  是等腰三角形 B.  $\sin A = \cos B$ ,  $\triangle ABC$  是直角三角形  
C.  $\sin^2 A + \sin^2 B + \cos^2 C < 1$ ,  $\triangle ABC$  是钝角三角形 D.  $AB = \sqrt{3}, AC = 1, B = 30^\circ$ ,  $\triangle ABC$  是锐角三角形

二、填空题 (每小题10分, 共60分)

7.  $\sin x > \cos x$ ,  $x \in (0, \pi)$ ,  $a$  与  $B$ , 且  $B \in (0, \frac{\pi}{2})$ .  $\sin B = \frac{1}{2}$ ,  $A = \frac{\pi}{3}$ ,  $A$  的取值范围是 \_\_\_\_\_.

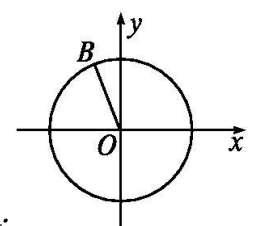
8.  $\sin(\frac{\pi}{2} - \alpha) = \cos \alpha$ ,  $\sin(\frac{\pi}{2} - \alpha) = \cos \alpha$  \_\_\_\_\_.

9. (2019 三)  $\sin^2(\frac{\pi}{2} - \alpha) + \cos^2(\alpha - \frac{\pi}{2}) = 1$ ,  $\alpha \in (0, \pi)$ ,  $\alpha =$  \_\_\_\_\_.

10. (2019 三)  $f(x) = \sin x + \sqrt{3} \cos x - a$  在  $[0, 2\pi]$  上恰有三个零点  $x_1, x_2, x_3$ ,  $x_1 + x_2 + x_3 =$  \_\_\_\_\_.

11. (2019 三)  $\sin x + \sqrt{3} \cos x + 1 \leq m$   $0 \leq x \leq \pi$ ,  $m$  的取值范围是 \_\_\_\_\_.

12. (2019 三)  $f(x) = 2\cos(\frac{\pi}{2} - x)\cos(x - \frac{\pi}{2}) + \sin x$ ,  $f(a_1) \leq f(x) \leq f(a_2)$ ,  $\cos(a_1 - a_2) =$  \_\_\_\_\_.



三、解答题（每小题15分，共30分）

13. (2019 )  $f(x) = 4\sqrt{\sin x \cos x} - 4\cos^2 x + m$ , 且  $f(-) = 7$ .

(1)  $m$  ;


(2)  $x \in [ , - ]$  , 不  $c < f(x) < 2c + 15$  ,  $c$  .

14. (2019 )  $f(x) = \cos x (\sin x - \sqrt{\cos x})$ ,  $x \in \mathbb{R}$ .

(1)  $f(x)$  ;

(2)  $f(x)$   $[ - , - ]$  上 .

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一、选择题 (每小题10分, 共60分)

1.  $f(x) = |\sin x \cdot \cos x|$  ( )

- A.  $\pi$  B.  $2\pi$  C.  $4\pi$  D.  $8\pi$

【 答 】 C  $f(x) = \frac{|\sin 2x|}{2}$ ,  $f(x)$  的周期为  $\pi$ .

2. (2019 年 11 月)  $\sin \alpha < 0$ , 则  $\tan \alpha$  ( )

- A.  $\cos \alpha > 0$  B.  $\tan \alpha > 0$  C.  $\cos \alpha < 0$  D.  $\tan \alpha < 0$

【 答 】 D  $\sin \alpha < 0$ ,  $2k\pi + \pi < \alpha < 2k\pi + 2\pi (k \in \mathbb{Z})$ ,  
 $k\pi + \pi < \alpha < k\pi + 2\pi (k \in \mathbb{Z})$ ,  $\tan \alpha > 0$ . D.

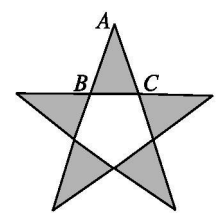
3.  $\alpha \in (0, \frac{\pi}{2})$  与  $y = x^4$  在  $(1, 1)$  处相切,  $\cos^2 \alpha - \sin 2\alpha$  ( )

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

【 答 】 D  $y' = 4x^3$ ,  $x=1$  时,  $y'=4$ ,  $\tan \alpha = 4$ ,  
 $\therefore \cos^2 \alpha - \sin 2\alpha = \frac{\cos^2 \alpha - \sin \alpha \cos \alpha}{\cos^2 \alpha + \sin^2 \alpha} = \frac{\tan \alpha - \sin \alpha \cos \alpha}{\tan^2 \alpha + 1} = \frac{4 - \frac{4}{5}}{16 + 1} = \frac{1}{5}$ . D.

4. (2019 年 11 月)  $\triangle ABC$  中,  $\angle A = 108^\circ$ ,  $\frac{BC}{AC} = \frac{\sqrt{5}-1}{2}$ , 则  $\sin 234^\circ =$  ( )

- A.  $\frac{\sqrt{5}-1}{2}$  B.  $-\frac{\sqrt{5}-1}{2}$  C.  $\frac{\sqrt{5}+1}{2}$  D.  $-\frac{\sqrt{5}+1}{2}$



【 答 】 C  $\angle ACB = 72^\circ$ , 且  $\cos 72^\circ = \frac{BC}{AC} = \frac{\sqrt{5}-1}{2}$ .  $\therefore \cos 144^\circ = -2\cos 72^\circ - 1 = -\frac{\sqrt{5}+1}{2}$ .  
 $\sin 234^\circ = \sin(144^\circ + 90^\circ) = \cos 144^\circ = -\frac{\sqrt{5}+1}{2}$ . C.

5. (2019 年 11 月)  $f(x) = \sin(\omega x + \phi)$  ( $\omega > 0$ ),  $f(x) \leq f(-x)$  对  $x \in \mathbb{R}$  恒成立, 则  $\omega$  的取值范围是 ( )

- A.  $(0, \frac{\pi}{2}]$  B.  $(0, \frac{\pi}{4}]$  C.  $(0, \frac{\pi}{8}]$  D. 1

【 答 】 B  $f(x) \leq f(-x)$  对  $x \in \mathbb{R}$  恒成立,  $\therefore f(x) = \sin(\omega x + \phi) \leq \sin(-\omega x + \phi)$ ,  
 $\omega > 0$ ,  $\omega = 2k\pi$ ,  $k \in \mathbb{Z}$ ,  
 $\omega > 0$ ,  $\omega = 2k\pi + \frac{\pi}{2}$ ,  $k \in \mathbb{Z}$ . B.

6. ( )  $\triangle ABC$ , 下 , ( )

A.  $\sin 2A = \sin 2B$ ,  $\triangle ABC \cong$  B.  $\sin A = \cos B$ ,  $\triangle ABC \cong$

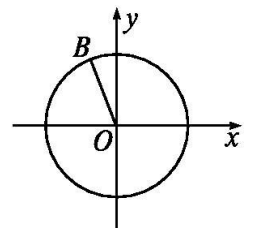
C.  $\sin^2 A + \sin^2 B + \cos^2 C < 1$ ,  $\triangle ABC \cong$  D.  $AB = \sqrt{3}, AC = 1, B = 30^\circ$ ,  $\triangle ABC \cong$   $\sqrt{3}$   $\sqrt{3}$

【 】 CD A:  $\because \sin 2A = \sin 2B, \therefore A = B$   $\triangle ABC \cong$  ,

$2A + 2B = \pi$   $A + B = \frac{\pi}{2}$ ,  $\triangle ABC \cong$  . A .

B:  $\because \sin A = \cos B, \therefore A - B = \frac{\pi}{2}$   $A + B = \frac{\pi}{2}$ .  $\therefore \triangle ABC$  不  $\cong$  . B .

C:  $\because \sin$



11. (2019 )  $\sin x + \sqrt{\cos x + 1} \leq m \quad 0 \leq x \leq \frac{\pi}{2}$ ,  
 $m$  \_\_\_\_\_.

【 】  $f(x) = \sin x + \sqrt{\cos x + 1} = 2\sin\left(\frac{x}{2}\right) + 1$ ,  
 $\because 0 \leq x \leq \frac{\pi}{2}, \therefore \frac{x}{2} \in \left[0, \frac{\pi}{4}\right], 2\sin\left(\frac{x}{2}\right) + 1 \in [2, 3]$ .  
 $\therefore \sin x + \sqrt{\cos x + 1} \leq m \quad 0 \leq x \leq \frac{\pi}{2}$ ,  
 $\therefore m \geq 3$ .

12. (2019 )  $f(x) = 2\cos\left(\frac{x}{2}\right)\cos\left(\frac{x}{2}\right) + \sin x$ ,  
 $x \in \left[\frac{\pi}{6}, \frac{\pi}{3}\right], f(a_1) \leq f(x) \leq f(a_2), \cos(a_1 - a_2) =$  \_\_\_\_\_.

【 】  $\because f(x) = 2\cos\left(\frac{x}{2}\right)\cos\left(\frac{x}{2}\right) + \sin x = 2\cos^2\left(\frac{x}{2}\right) + \sin x$   
 $= \cos 2x + \sin x = 2\sin^2\left(\frac{x}{2}\right) + \sin x$ ,  
 $\because \sin x \in [-1, 1], \therefore f(x) \in \left[\frac{1}{2}, \frac{3}{2}\right]$ ,  
 $x \in \left[\frac{\pi}{6}, \frac{\pi}{3}\right], f(a_1) \leq f(x) \leq f(a_2), f(a_1) = \frac{1}{2}, f(a_2) = \frac{3}{2}$ ,  
 $\sin a_1 = -1, \sin a_2 = 1, \cos a_1 = 0$ ,  
 $\therefore \cos(a_1 - a_2) = \cos a_1 \cos a_2 + \sin a_1 \sin a_2 = 0 + (-1) \times 1 = -1$ .

三、解答题 (每小题15分, 共30分)

13. (2019 )  $f(x) = 4\sqrt{c} \sin x \cos x - 4\cos^2 x + m$ , 且  $f(-) = 7$ .

(1)  $m$  ;

(2)  $x \in [ , - ]$ , 不  $c < f(x) < 2c + 15$ ,  $c$  .

【 】 (1)  $f(x) = 4\sqrt{c} \sin x \cos x - 4\cos^2 x + m = 4\left(\frac{\sqrt{c}}{2} \sin 2x - \cos^2 x\right) + m - 2 = 4\sin\left(2x - \frac{\pi}{4}\right) + m - 2$ ,  
 $f(-) = 7$ ,  $4\sin - + m - 2 = 7$ ,  $m = 7$ .

(2) (1)  $f(x) = 4\sin\left(2x - \frac{\pi}{4}\right) + 5$ ,

$\because x \in [ , - ]$ ,  $\therefore 2x - \frac{\pi}{4} \in [ -\frac{\pi}{4}, -\frac{3\pi}{4} ]$ ,

$\therefore -\frac{\sqrt{2}}{2} \leq \sin\left(2x - \frac{\pi}{4}\right) \leq \frac{\sqrt{2}}{2}$ ,  $3 \leq f(x) \leq 2\sqrt{2} + 5$ ,

不  $c < f(x) < 2c + 15$  ,

$\begin{cases} \sqrt{c} > 3 \\ \sqrt{c} - 5 < c < 3 \end{cases}$ ,

$\therefore c \in (\sqrt{2} - 5, 3)$ .

14. (2019 )  $f(x) = \cos x (\sin x - \sqrt{c} \cos x)$ ,  $x \in \mathbb{R}$ .

(1)  $f(x)$  ;

(2)  $f(x)$   $[ -\frac{\pi}{2}, -\frac{3\pi}{4} ]$  上 .

【 】 (1)  $f(x) = \cos x \sin x - \sqrt{c} \cos^2 x = \frac{1}{2} \sin 2x - \frac{\sqrt{c}}{2} (1 + \cos 2x)$   
 $= \frac{1}{2} \sin 2x - \frac{\sqrt{c}}{2} - \frac{\sqrt{c}}{2} \cos 2x = \frac{1}{2} \sin\left(2x - \frac{\pi}{2}\right) - \frac{\sqrt{c}}{2}$ .

$f(x)$   $T = \pi$ ,  $1 - \frac{\sqrt{c}}{2}$ .

(2)  $z = 2x - \frac{\pi}{2}$ ,

$y = 2\sin z = 2\sin\left(2x - \frac{\pi}{2}\right) \in [ -2, 2 ]$ ,  $k \in \mathbb{Z}$ .

$-\frac{\pi}{2} + 2k\pi \leq 2x - \frac{\pi}{2} < -\frac{\pi}{2} + 2(k+1)\pi$ ,  $-\frac{\pi}{4} + k\pi \leq x < \frac{\pi}{4} + k\pi$ ,  $k \in \mathbb{Z}$ .

$A = [ -\frac{\pi}{2}, -\frac{3\pi}{4} ]$ ,  $B = \left\{ x \mid -\frac{\pi}{4} + k\pi \leq x < \frac{\pi}{4} + k\pi, k \in \mathbb{Z} \right\}$ ,

$A \cap B = [ -\frac{\pi}{2}, -\frac{3\pi}{4} ]$ .

$\therefore x \in [ -\frac{\pi}{2}, -\frac{3\pi}{4} ]$ ,  $f(x)$   $[ -\frac{\pi}{2}, -\frac{3\pi}{4} ]$  上 ;  $[ -\frac{\pi}{2}, -\frac{3\pi}{4} ]$  上 .