

1 $z = i^{2021} - \frac{1-i}{i}$ $|z| =$

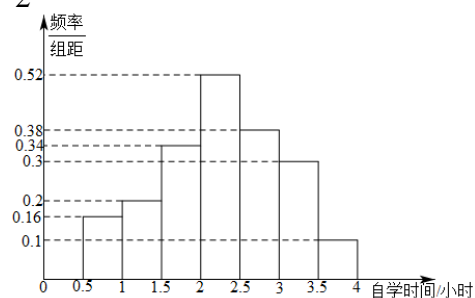
- A $\sqrt{5}$ B $\sqrt{3}$ C 2 D 1

2 $|\vec{a}|=1, |\vec{b}|=6, \vec{a} \cdot (\vec{b}-\vec{a})=2$ \vec{a} \vec{b}

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

3 0.01

- A 2.20 2.25 B 2.29 2.20
C 2.29 2.25 D 2.25 2.25



4 5 3 2 2

- A 1 1 B 1 2
C 1 1 D 1 2

5 $y = bx + a$ 1.23 (4 5) $x = 2$ y

- A 6.46 B 7.46 C 2.54 D 1.39

6 A 2000 1 2000 1 50 1 m
 $m+50$ $m+100$ $m+150$

B s^2 \bar{x} 2
 $4s^2$ $2\bar{x}$

C r 1.

D 1 a 3 2 $\frac{2}{3}$

7 2 $ABCDEF$ P

- A $1 - \frac{\sqrt{3}\pi}{9}$ B $1 - \frac{\sqrt{3}\pi}{18}$ C $1 - \frac{\sqrt{3}\pi}{27}$ D $1 - \frac{\sqrt{3}\pi}{12}$



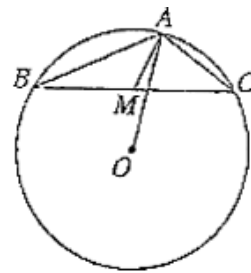
8 ΔABC A, B, C $c > b > a$ $\vec{m} = (a-b, 1)$ $\vec{n} = (b-c, 1)$

$\sin B = \frac{4}{5}$ ΔABC $\frac{3}{2}$ $b =$

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

9 $\vec{a} = (-2, 1)$ $\vec{b} = (\lambda, -1)$ $\vec{a} \cdot \vec{b} = \lambda$

A $\left(-\frac{1}{2}, 2\right) \cup (2, +\infty)$ B $(2, +\infty)$ C $\left(-\frac{1}{2}, +\infty\right)$ D $\left(-\infty, -\frac{1}{2}\right)$



10 $O \triangle ABC$ $AB=4$ $AC=2$ $\angle BAC$

M BC $\overline{AM} \cdot \overline{AO}$

A $2\sqrt{3}$ B 12 C 6 D 5

11 $y = 2 \sin\left(3x + \frac{\pi}{4}\right) + 1$

A. $x = -\frac{\pi}{4}$ B. $\left(\frac{\pi}{12}, 1\right)$

C. $[-1, 3]$ D. $y = 2 \sin\left(x + \frac{\pi}{4}\right) + 1$ $\frac{1}{3}$

12 \vec{a}, \vec{b} $\vec{x}_1, \vec{x}_2, \vec{x}_3, \vec{x}_4, \vec{x}_5$ $\vec{y}_1, \vec{y}_2, \vec{y}_3, \vec{y}_4, \vec{y}_5$ $2 \vec{a}$ $3 \vec{b}$

$S = \vec{x}_1 \cdot \vec{y}_1 + \vec{x}_2 \cdot \vec{y}_2 + \vec{x}_3 \cdot \vec{y}_3 + \vec{x}_4 \cdot \vec{y}_4 + \vec{x}_5 \cdot \vec{y}_5$ S_{\min} S

A $S = 5$ B $\vec{a} \perp \vec{b}$ $S_{\min} = |\vec{a}|$

C \vec{a} / \vec{b} $S_{\min} = |\vec{b}|$ D $|\vec{b}| > 4|\vec{a}|$ $S_{\min} > 0$

4 20 2 3 .

13 $f(x) = \sin 2x + 2 \sin^2 x - 1$ $x \in \mathbf{R}$

14 40 5 1 ~ 40

1 1 2

2 5

5	9
6	2
7	0 3
8	1

15 $ABCD$ $AB=2$ $BC=1$ O AB

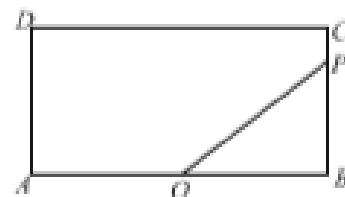
1 P BC $\overline{AB} \cdot \overline{OP}$

2 P BC CD DA $\overline{AB} \cdot \overline{OP}$

16 $\triangle ABC$ A, B, C $A = 2B$

1 B

2 $\frac{a}{b} + \frac{b}{a}$



6 70

17 10

12

17 5 2 1 1

1 $P(A)$

2 $P(B)$

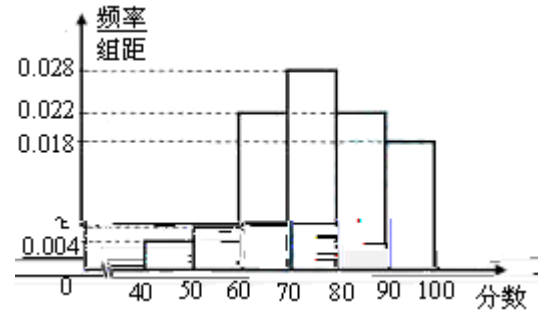
3 $P(C)$

4 $P(D)$

18.

1 a
 2 80
 3 [40,60) 2
 2 [40,50)

50 50
 [40,50),[50,60),..., [80,90),[90,100]



19

P

1 t (min) P $f(t) = A \sin(\omega t + \varphi) + h$ $A > 0, \omega > 0, |\varphi| < \pi$

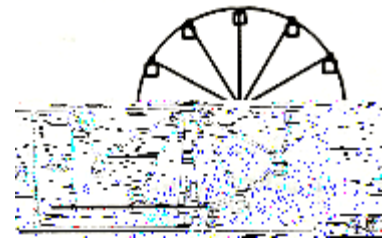
2017 min P

2 $(50 + 20\sqrt{3})$ m

40 m

50 m

3 min



20 $\vec{m} = (2\cos x + 2\sqrt{3}\sin x, 1)$ $\vec{n} = (\cos x, -y)$ $\vec{m} \perp \vec{n}$.

1 y x $f(x)$ $f(x)$;

2 ΔABC A, B, C $f(\frac{A}{2}) = 3$ $a = 2$ $b + c = 4$

ΔABC

