

2020年天津南开区高三一模数学试卷(答案)

一、选择题

1. C

2. A

3. B

4. D

5. B

6. D

7. C

8. A

9. B

二、填空题

10. 2

11. $-\frac{5}{2}$

12. 2 : 3

13. $\frac{12}{5}; \frac{63}{64}$ 14. $\left[1 - 2^{\frac{\sqrt{2}}{3}}, 1\right)$ 15. $\frac{13}{2}; \frac{5\sqrt{7}}{14}$

三、解答题

16. (1) $c = \sqrt{7}, \cos A = \frac{\sqrt{7}}{14}$.
 (2) $-\frac{1}{7}$.

17. (1) $\frac{\sqrt{3}}{3}$.
 (2) 30° .
 (3) $\frac{BP}{PC_1} = 1$.

18. (1) $a_n = n, n \in \mathbf{N}^*; b_n = \begin{cases} 2^{\frac{n+1}{2}}, n \text{ 为奇数} \\ 2^{\frac{n}{2}}, n \text{ 为偶数} \end{cases}$.
 (2) $\sum_{i=1}^n a_i \left(b_{2i-1} - \frac{1}{b_{2i}} \right) = (n-1) \cdot 2^{n+1} + \frac{n+2}{2^n}$.

19. (1) 椭圆标准方程为 $\frac{x^2}{4} + \frac{y^2}{3} = 1$.
 (2) 直线方程为 $\sqrt{5}x \pm 2y - \sqrt{5} = 0$.
 (3) 证明见解析 .

20. (1) $a = 1$.

(2) $[2, +\infty)$.

(3) $a \leq 0$ 或 $a > \frac{e}{e-1}$.