

2023 年青海省初中学业水平考试

数学试卷

1. D 2. C 3. A 4. D 5. B 6. B 7. C 8. C

9. 3 10. -1(或 0 或 1) 11. 1.059×10^{10} 12. (2, 2)

13. 53° 14. $16 - 4\pi$ 15. 13 16. 10

17. 解: 原式 $= 2\sqrt{3} + \frac{1}{2} + 1 - \frac{1}{2}$
 $= 2\sqrt{3} + 1.$

18. 解: 原式 $= \frac{(x-1)(x+1)}{x} \div \frac{x+1}{x}$
 $= \frac{(x-1)(x+1)}{x} \cdot \frac{x}{x+1}$
 $= x-1.$

当 $x = \sqrt{5} + 1$ 时, 原式 $= \sqrt{5} + 1 - 1 = \sqrt{5}.$

19. 解: (1) 由图象知, 一次函数与反比例函数的一个交点的横坐标为 1, 且反比例函数解析式为 $y = \frac{2}{x}$, 则交点的纵坐标为 2.

将 (1, 2) 代入 $y = kx + 1$ 得 $2 = k + 1$, 解得 $k = 1$,

\therefore 一次函数的解析式为 $y = x + 1$.

(2) 当 $x > 0$, 即图象在 y 轴的右侧时, 观察图象发现: 当图象在直线 $x = 1$ 的右侧时, 一次函数的图象在反比例函数图象的上方,

\therefore 不等式 $kx + 1 > \frac{2}{x}$ 的解集为 $x > 1$.

20. 解: (1) 解不等式①, 得 $x < 4$,

解不等式②, 得 $x > 1$,

\therefore 不等式组的解集为 $1 < x < 4$.

(2) 由 (1) 知 $1 < x < 4$,

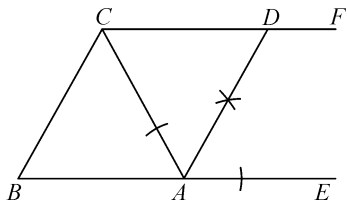
\therefore 令 $m = 2$, 则方程为 $x^2 - 2x - 2 = 0$.

$\therefore \Delta = (-2)^2 - 4 \times 1 \times (-2) = 12$,

$$\therefore x = \frac{2 \pm \sqrt{12}}{2 \times 1} = 1 \pm \sqrt{3},$$

$\therefore x_1 = 1 + \sqrt{3}, x_2 = 1 - \sqrt{3}$. (答案不唯一)

21. (1) 解: 如答图, AD 即为所求.



第 21 题答图

(2) 证明: $\because AB = AC, \therefore \angle B = \angle ACB$.

$\because AD$ 平分 $\angle CAE, \therefore \angle CAD = \angle EAD$.

$\because \angle CAE = \angle B + \angle ACB$, 即 $\angle CAD + \angle EAD = \angle B + \angle ACB$,

$\therefore \angle EAD = \angle B, \therefore AD \parallel BC$.

$\because AB \parallel CD, \therefore$ 四边形 ABCD 是平行四边形.

22. 解: 如答图, 过点 B 作 $BD \perp AC$, 垂足为 D.

$\because \angle BAC = 30^\circ, \angle ABC = 136^\circ$,

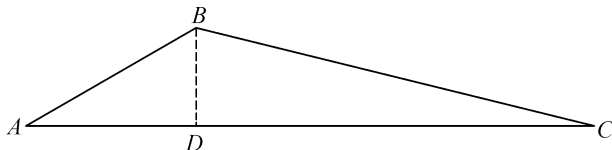
$\therefore \angle C = 180^\circ - \angle BAC - \angle ABC = 14^\circ$.

在 $Rt\triangle ABD$ 中, $AB = 1\,000$ m, $\angle BAD = 30^\circ$,

$$\therefore BD = \frac{1}{2} AB = 500(\text{m}).$$

在 $Rt\triangle BDC$ 中, $BC = \frac{BD}{\sin 14^\circ} \approx \frac{500}{0.24} \approx 2\,083(\text{m})$,

$\therefore B, C$ 两点间的距离约 2 083 m.

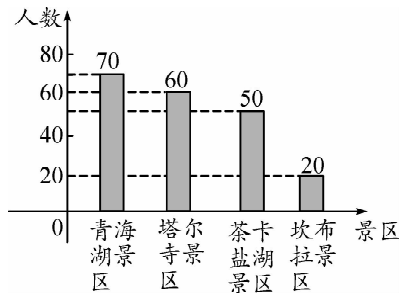


第 22 题答图

23. 解: (1) 200

(2) B 组的人数为 $200 - 70 - 20 - 50 = 60$ (人).

补充条形统计图如答图①.

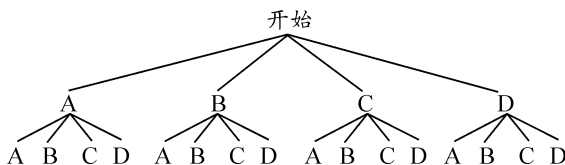


第 23 题答图①

$$(3) 19 \times \frac{70}{200} = 6.65(\text{万}).$$

答: 估计前往青海湖景区的游客约 6.65 万人.

(4) 根据题意画树状图如答图②.



第 23 题答图②

由树状图可知, 共有 16 种等可能的结果, 其中两人选择同一景区的结果数为 4,

$$\therefore \text{他们选择同一景区的概率为 } \frac{4}{16} = \frac{1}{4}.$$

24. 解: (1) 由题意得 $\begin{cases} -1 + b + c = 0, \\ c = 3, \end{cases} \therefore \begin{cases} b = -2, \\ c = 3, \end{cases}$

\therefore 此二次函数的解析式为 $y = -x^2 - 2x + 3$.

(2) 如答图, 连接 OP.

$$\because y = -x^2 - 2x + 3 = -(x+1)^2 + 4,$$

$$\therefore P(-1, 4), \therefore PQ = 4, OQ = 1.$$

$$\text{令 } -x^2 - 2x + 3 = 0, \text{ 解得 } x_1 = 1, x_2 = -3, \therefore OA = 3,$$

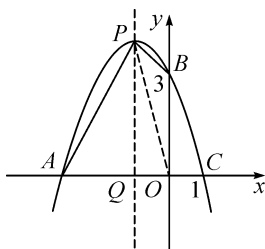
$$\therefore S_{\text{四边形AOBP}} = S_{\triangle AOP} + S_{\triangle BOP}$$

$$\begin{aligned}
&= \frac{1}{2} OA \cdot PQ + \frac{1}{2} OB \cdot OQ \\
&= \frac{1}{2} \times 3 \times 4 + \frac{1}{2} \times 3 \times 1 \\
&= \frac{15}{2}.
\end{aligned}$$

(3) 存在.

设 $M(-1, m)$,

由 $AM^2 = BM^2$ 得 $[(-3) - (-1)]^2 + m^2 = (-1)^2 + (m - 3)^2$, $\therefore m = 1$, \therefore 满足条件的点 M 的坐标为 $(-1, 1)$.



第 24 题答图

25. 解: (1) 如答图①, 连接 BC .

$\because AB = AD = 2, AC \perp BD, \therefore \angle BAC = \angle CAD =$

$$\frac{1}{2} \angle BAD = 60^\circ.$$

$\because AB = AC, \therefore \triangle ABC$ 是等边三角形, $\therefore AC = AB = 2$,

$$\therefore d_1 = CE = \frac{1}{2} AC = 1.$$

(2) 如答图②.

$\because AB = AD, AC \perp BD, \angle BAD = 90^\circ$,

$\therefore \angle ABD = \angle ADB = 45^\circ$,

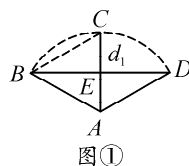
$$\therefore AE = AB \cdot \sin \angle ABD = 2 \times \frac{\sqrt{2}}{2} = \sqrt{2},$$

$$\therefore d_2 = CE = AC - AE = 2 - \sqrt{2}.$$

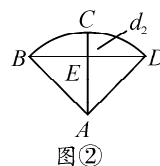
(3) $60^\circ \quad 2 - \sqrt{3}$

(4) $d_1 > d_2 > d_3$ 越小

(5) 0



图①



图②

第 25 题答图