

2015-2016 学年成华区 九年级上期末 数学 试题详解

名师微点评

A 卷 关注微信公众号“成都学而思1对1”即可获取免费资讯资料

一. 选择题.

1~5. AACCB 6~10. BDADB

二. 填空题.

11. 30° 12. 3 13. $a \geq 1$ 且 $a \neq 5$

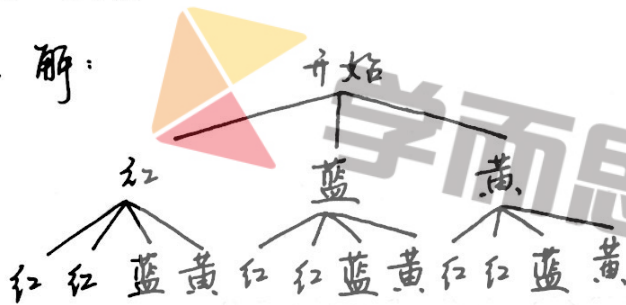
14. $\frac{3}{4}$

三. 解答题.

15. (1) -1 (2) $x_1 = 6, x_2 = -1$

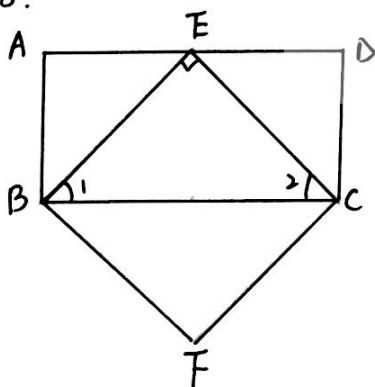
16. $BD = 20m$

17. (1). 解:



(2). 由(1). $P(\text{小明}) = \frac{3}{12} = \frac{1}{4}$, $P(\text{小丽}) = \frac{9}{12} = \frac{3}{4}$
 \therefore 这个游戏对双方不公平.

18.



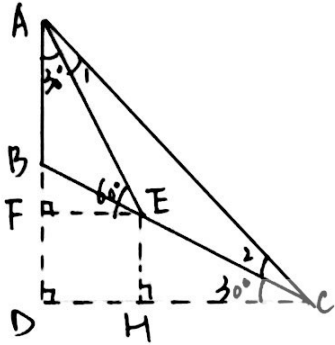
证: 由题: $\angle 1 = \angle 2 = 45^\circ$, $\angle BEC = 90^\circ$.
 $\therefore BF \parallel CE$, $\therefore \angle EBF = 90^\circ$.
 $\therefore CF \parallel BE$, $\therefore \angle ECF = 90^\circ$.
 \therefore 四边形 $EBFC$ 为矩形.
 又 $\because BE = EC$.
 \therefore 四边形 $EBFC$ 为正方形.

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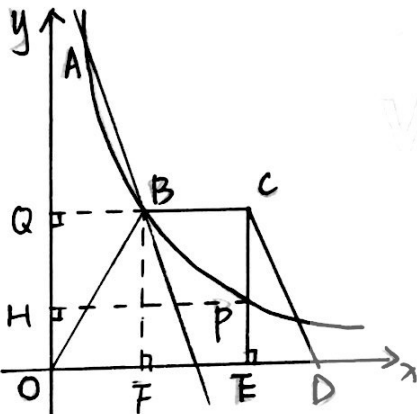
19.



解: $\because \angle DAE = \angle BCD = 30^\circ$
 $\therefore \angle 1 = \angle 2 = 15^\circ$
 $\therefore AE = CE = 100$
 $EF = EH = 50$
 $CD = AD = 50 + 50\sqrt{3}$
 $\therefore BD = CD \cdot \tan 30^\circ = \frac{50\sqrt{3}}{3} + 50$
 $\therefore AB = 50 + 50\sqrt{3} - (\frac{50\sqrt{3}}{3} + 50)$
 $= \frac{100\sqrt{3}}{3}$
 $\because \sqrt{3} \approx 1.73 \therefore AB \approx 58m$

答: 塔高AB大约为58m.

20.



解: (1) $k_2 = 6, y = \frac{6}{x}$
 $\therefore B(2, 3)$
 $\therefore y = -3x + 9$

(2) 由题: $-3x + 9 > \frac{6}{x}$ 且 $x > 0$
 则 $1 < x < 2$.

(3) $PC = PE$. 证明如下:

法一:

过P作y轴垂线交y轴于H.
 延长CB交y轴于Q.

$\therefore \angle QBO = \angle BOF = \angle CDE$
 在 $\triangle BQO$ 和 $\triangle DEC$ 中
 $\begin{cases} \angle BQO = \angle DEC \\ \angle QBO = \angle EDC \\ BO = DC \end{cases}$

$\triangle BQO \cong \triangle DEC$.

$\therefore S_{\text{矩形}QOEC} = 12$. 又: $S_{\text{矩形}PEOH} = 6$

$\therefore S_{\text{矩形}CPHQ} = S_{\text{矩形}PEOH}$

$\therefore PC = PE$

法二: 过B作x轴垂线交x轴于F.

$\therefore \triangle BQO \cong \triangle DEC$

$\therefore S_{\text{矩形}CQOE} = 12$

又: $S_{\text{矩形}BQOF} = 6$.

$\therefore BQ = BC \therefore C(4, 3)$.

$\therefore P(4, \frac{3}{2})$.

$\therefore PC = PE$.

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解题老师: 吴江天

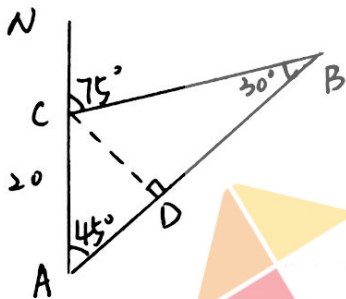
B卷.

四. 填空题.

21. 分析: $x^2 - 6x - 5 = 0$. $\begin{cases} x_1 + x_2 = 6 \\ x_1 x_2 = -5 \end{cases}$

$\therefore \frac{1}{x_1} + \frac{1}{x_2} = \frac{x_1 + x_2}{x_1 x_2} = -\frac{6}{5}$

22. 分析:



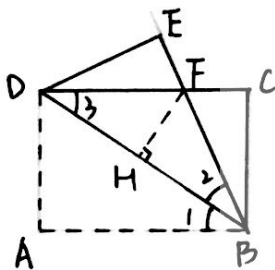
过C作AB垂线交AB于D. $\because AC=20$

则 $AD=CD=10\sqrt{2}$.

$\therefore \angle NCB=75^\circ$. $\therefore \angle B=30^\circ$

$\therefore BC=20\sqrt{2}$ (海里)

23.



分析: 过F作BD垂线交BD于H.

$\therefore \angle 1 = \angle 2 = 30^\circ$. $CD \parallel AB$

$\therefore \angle 1 = \angle 2 = \angle 3 = 30^\circ$.

$\therefore FD = FB$.

$\therefore H$ 为 BD 中点.

$\therefore BD = 4$. $\therefore BH = 2$.

$\therefore FH = \frac{2\sqrt{3}}{3}$

24. 分析: $\begin{cases} \frac{3x-2}{2} < x + \frac{3}{2} \quad \text{①} \\ ax > b. \quad \text{②} \end{cases}$

解①得: $x < 5$.

i. 若 $a > 0$.

则解②得: $x > \frac{b}{a}$

$\frac{b}{a} < x < 5$

若解集中有且只有2个非负整数.

则 $\frac{b}{a} = 2$

只有当 $a=1, b=2$ 时符合.

ii. 若 $a < 0$.

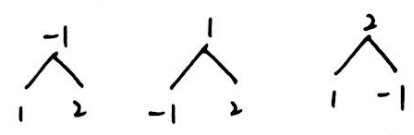
则解②得: $x < \frac{b}{a}$

$\therefore \frac{b}{a} < 5$. $\therefore x < \frac{b}{a}$

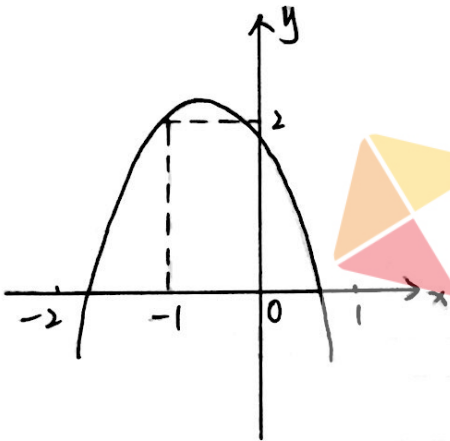
若解集中有且只有2个非负整数.

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则 $\frac{b}{a} = 2$. 此种情况不存在.
 \therefore 由树状图可知:

 解集中有且只有2个非负整数的概率为 $\frac{1}{3}$.

25.



分析:

①: 当 $x = -2$ 时,
 $y = 4a - 2b + c < 0$. \therefore ① 正确.

②: 对称轴: $x = -\frac{b}{2a} > -1$. 且 $a < 0$.
 $\therefore 2a - b < 0$. ② 正确

③: 当 $x = -1$ 时, $a - b + c = 2$. (1)
 当 $x = 1$ 时 $a + b + c < 0$. (2)
 由 (2) - (1): $2b < -2$ $b < -1$.

④ 错误.

$$\textcircled{4} \therefore \begin{cases} a - b + c = 2 & (1) \\ 4a - 2b + c < 0 & (2) \\ a + b + c < 0 & (3) \end{cases}$$

(2) + (1) $\times (-2)$ 得: $2a - c < -4$ (4)

(1) + (3) 得: $a + c < 1$. (5)

(4) + (5) 得: $3a < -3$ $a < -1$.

\therefore ④ 错误.

⑤ $\therefore a - b + c = 2$. $\therefore a + c = b + 2$

$(a + c)^2 = (b + 2)^2 = b^2 + 4b + 4$

由 ③: $b < -1$. $\therefore 4b + 4 < 0$.

$\therefore b^2 + 4b + 4 < b^2$

$\therefore (a + c)^2 < b^2$. ⑤ 正确.

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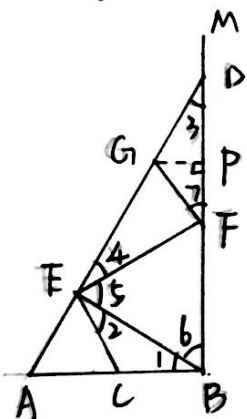
五. 解答题.

26. 解: (1). $y = 700 - 20(x - 45)$
即 $y = -20x + 1600$ ($45 \leq x \leq 80$)

(2). $P = (x - 40)(-20x + 1600)$
 $= -20x^2 + 2400x - 64000$ ($45 \leq x \leq 80$)
当 $x = 60$ 时, $P_{max} = 8000$.

答: 当每盒售价为60元时, 每天销售的利润最大, 为8000元.

27.



(1). 证: 由题: $EC = AC = BC$. $\therefore \angle 1 = \angle 2$.
 $\therefore \angle 2 + \angle 5 = \angle 4 + \angle 5 = 90^\circ$. $\therefore \angle 2 = \angle 4$.
 $\therefore \angle 1 = \angle 3$. $\therefore \angle 3 = \angle 4$.
 $\therefore \angle 4 + \angle 5 = \angle 3 + \angle 6$. $\therefore \angle 5 = \angle 6$.
 $\therefore DF = EF = BF$.

(2). 四边形ALFE为平行四边形. 理由如下:
 $\because \angle A = 45^\circ$. $\therefore \triangle AEB, \triangle DEB, \triangle ABD$ 均为等腰Rt \triangle .

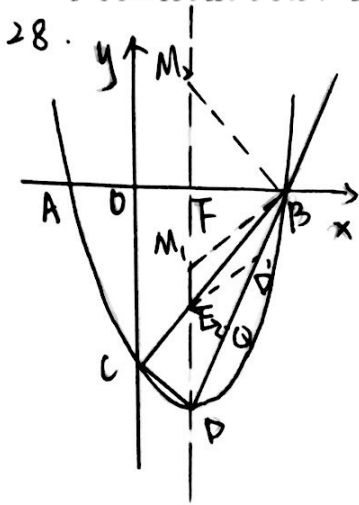
$\therefore AC = \frac{1}{2}AB$. $EF \perp BD$ 且 $EF = \frac{1}{2}BD$.
 $\therefore EF \parallel AC$. \therefore 四边形ALFE为平行四边形.

(3). 解: 过G作BD垂线交BD于P.
若 $DG = \frac{1}{4}AD$. 则 $DP = \frac{1}{4}DB$.
又 $DF = \frac{1}{2}DB$. $\therefore P$ 为DF中点.
则 $GD = GF$. $\angle 3 = \angle 7 = \angle 4$.
 $\therefore 3 < 3 \leq 180^\circ$. $\angle 3 \leq 60^\circ$.
 $\therefore \angle A = 90^\circ - \angle 3$. $\therefore \angle A \geq 30^\circ$.
 $\therefore 30^\circ \leq \angle A < 90^\circ$.

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11. 解: 由题可得:
$$\begin{cases} 1-b+c=0 \\ c=-3 \end{cases} \therefore \begin{cases} b=-2 \\ c=-3 \end{cases}$$

$\therefore y = x^2 - 2x - 3. \quad B(3, 0).$
 $D(1, -4).$

12. 解: 过B作 $\angle FBD$ 角平分线交DE于 M_1 .
作 $\angle FBD$ 外角平分线交DE于 M_2 .

$BD = 2\sqrt{5}. \quad BF = 2.$

由角平分线定理: $-\frac{FM_1}{M_1D} = \frac{BF}{BD} = \frac{1}{\sqrt{5}}.$

$\therefore FM_1 = \sqrt{5} - 1. \quad \therefore M_1(1, 1 - \sqrt{5}).$

$\frac{FM_2}{M_2D} = \frac{BF}{BD} = \frac{1}{\sqrt{5}}.$

$FM_2 = \sqrt{5} + 1. \quad \therefore M_2(1, 1 + \sqrt{5})$

即上: $M_1(1, 1 - \sqrt{5}) \quad M_2(1, 1 + \sqrt{5})$

13. 解: $l_{BC}: y = x - 3. \quad \therefore E(1, -2).$

i. 过E作BD垂线交BD于Q.

则此时 $\triangle EQD'$ 与 $\triangle EQB$ 的重叠部分图像为直角三角形.

$\therefore DE = 2. \quad \tan \angle BOF = \frac{1}{2}.$

$\therefore DQ = \frac{4\sqrt{5}}{5}$

ii. 如图. 若 $ED' \perp BD$ 交BD于H.

$\therefore k_{BC} = 1. \quad k_{CD} = -1. \quad \therefore BC \perp CD$

且 $BC = 3\sqrt{2}. \quad CD = \sqrt{2}. \quad \therefore \sin \angle CBD = \frac{1}{\sqrt{10}}$

$\therefore \sin \angle CBD = \frac{EH}{BE} = \frac{1}{\sqrt{10}}. \quad \therefore BE = 2\sqrt{2}$

$\therefore EH = \frac{2\sqrt{5}}{5}. \quad \therefore \angle DEQ = \angle D'EQ$

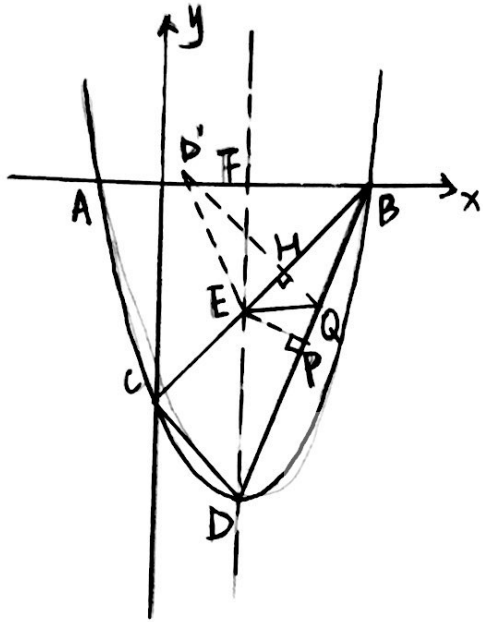
由角平分线定理: $\frac{DQ}{QH} = \frac{ED}{EH} = \sqrt{5}.$

又由 i. $DH = \frac{4\sqrt{5}}{5}. \quad \therefore DQ = \frac{4\sqrt{5}}{5} \cdot \frac{\sqrt{5}}{1 + \sqrt{5}}$

$DQ = \sqrt{5} - 1$

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iii. 如图, 若 $QD' \perp BC$, 交 BC 于 H .

过 E 作 BD 垂线交 BD 于 P .

由 i. $EP = \frac{2\sqrt{5}}{5}$

$\therefore \angle DQE = \angle D'QE$

$\therefore EH = EP = \frac{2\sqrt{5}}{5}$. 又 $\because BE = 2\sqrt{2}$

$\therefore BH = 2\sqrt{2} - \frac{2\sqrt{5}}{5}$

由 ii. $\sin \angle CBD = \frac{1}{\sqrt{10}}$.

$\therefore \cos \angle CBD = \frac{3}{\sqrt{10}}$.

$\therefore BQ = \frac{2\sqrt{2} - \frac{2\sqrt{5}}{5}}{\frac{3}{\sqrt{10}}}$

$= \frac{4\sqrt{5}}{3} - \frac{2\sqrt{2}}{3}$

又 $\because BD = 2\sqrt{5}$

$\therefore DQ = 2\sqrt{5} - \frac{4\sqrt{5}}{3} + \frac{2\sqrt{2}}{3}$

$= \frac{2\sqrt{5}}{3} + \frac{2\sqrt{2}}{3}$

综上: DQ 的长度可为 $\frac{4\sqrt{5}}{5}$ 或 $\sqrt{5}-1$ 或 $\frac{2\sqrt{5}}{3} + \frac{2\sqrt{2}}{3}$.



学而思 1对1

优 com