

2017—2018 学年度下期期末综合素质测评

七年级数学参考答案及评分意见

考试时间：120 分钟

满分：150 分

A 卷（共 100 分）

第 I 卷(选择题，共 30 分)

一、选择题(本大题共 10 个小题，每小题 3 分，共 30 分，每小题均有四个选项，其中只有一项符合题目要求，答案涂在答题卡上)

1、D 2、C 3、B 4、D 5、D 6、C 7、B 8、A 9、C 10、A

第 II 卷(非选择题，共 70 分)

二、填空题(本大题共 4 个小题，每小题 4 分，共 16 分，答案写在答题卡上)

11、1 12、 70° 13、4 14、 36° 或 90°

三、解答题(本大题共 5 个小题，共 54 分，答案写在答题卡上)

15. (本小题满分 12 分，每小题 6 分)

$$\text{解：(1)原式} = \frac{1}{4} - 2 \times (10 \times \frac{1}{10})^3 + 2 \dots\dots\dots 2\text{分}$$

$$= \frac{1}{4} - 2 + 2 \dots\dots\dots 4\text{分}$$

$$= \frac{1}{4} \dots\dots\dots 6\text{分}$$

$$(2) \text{原式} = mn - 4n^2 - (m^2 - 4n^2) \dots\dots\dots 4\text{分}$$

$$= mn - 4n^2 - m^2 + 4n^2 \dots\dots\dots 5\text{分}$$

$$= mn - m^2 \dots\dots\dots 6\text{分}$$

16. (本小题满分 6 分)

化简求值： $[(2a+1)^2 - 2a(a^2+a) - 1] \div (2a)$ ，其中 $a^2 - a - 6 = 0$ 。

$$\text{解：}\because a^2 - a - 6 = 0$$

$$\therefore a^2 - a = 6 \dots\dots\dots 1\text{分}$$

$$\therefore \text{原式} = (4a^2 + 4a + 1 - 2a^3 - 2a^2 - 1) \div (2a) \dots\dots\dots 3\text{分}$$

$$= (-2a^3 + 2a^2 + 4a) \div (2a)$$

$$= -a^2 + a + 2 \dots\dots\dots 5\text{分}$$

$$= -(a^2 - a) + 2$$

$$= -6 + 2$$

$$= -4 \dots\dots\dots 6\text{分}$$

17. (本小题满分 8 分)

(1) 地面高度或 h; 空气中的气温或 T. 2 分

解: (2) $T = 26 - 4h$ 5 分

$$(3) \because T = -6$$

$$\therefore 26 - 4h = -6$$

$$\therefore h = 8(\text{km})$$

\therefore 当距地面高度为 8km 时, 空中气温为 -6°C 8 分

18. (本小题满分 8 分)

解: $\because AB \parallel CD$

$$\therefore \angle EFD = \angle 1, \angle 2 = \angle CFH$$

$$\because \angle 1 = 50^{\circ}$$

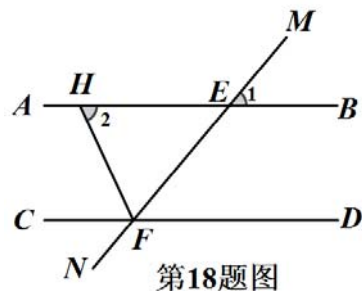
$$\therefore \angle EFD = 50^{\circ} \dots\dots\dots 3\text{分}$$

$$\therefore \angle CFE = 180^{\circ} - \angle EFD = 130^{\circ} \dots\dots\dots 4\text{分}$$

$\because HF$ 平分 $\angle CFE$

$$\therefore \angle CFH = \frac{1}{2} \angle CFE = 65^{\circ} \dots\dots\dots 6\text{分}$$

$$\therefore \angle 2 = \angle CFH = 65^{\circ} \dots\dots\dots 8\text{分}$$



19. (本小题满分 10 分).

(1, $m = 10$, $n = 0.16$ 4 分

(2) 解: 因为小颖掷一次骰子出现的点数可能为 1, 2, 3, 4, 5, 6 共六种结果, 而小明掷出的点数为 4, 所以当小颖掷出的点数为 5 或 6 时, 小颖获胜; 当小颖掷出的点数为 1 或 2 或 3 时, 小明获胜.

$$\therefore P(\text{小颖获胜}) = \frac{2}{6} = \frac{1}{3} \dots\dots\dots 7\text{分}$$

$$P(\text{小明获胜}) = \frac{3}{6} = \frac{1}{2} \dots\dots\dots 10\text{分}$$

20. (本小题满分 10 分)

证明: (1) $\because AB = AC$, AE 为 BC 边上的高

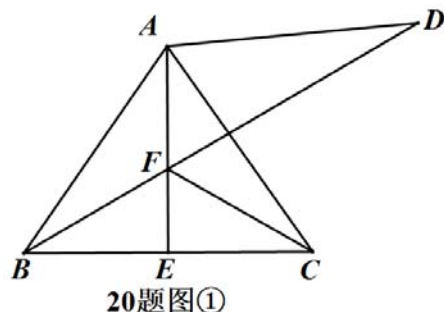
$$\therefore BE = EC$$

$\therefore AE$ 为 BC 边的垂直平分线 2 分

\because 点 F 在 AE 上

$$\therefore BF = CF \dots\dots\dots 3\text{分}$$

(此题也可证 $\triangle ABF \cong \triangle ACF$)



(2) $\because AB=AC$, AE 为 BC 边上的高

$$\therefore \angle BAF = \angle CAF = \frac{1}{2} \angle BAC$$

$$\because \angle BAC = 40^\circ$$

$$\therefore \angle BAF = 20^\circ \dots\dots\dots 4 \text{ 分}$$

$$\because AB=AC, AD=AC$$

$$\therefore AB=AD$$

$$\therefore \angle ABF = \angle D$$

$$\because \angle BAC = 40^\circ, \angle CAD = 60^\circ$$

$$\therefore \angle BAD = \angle BAC + \angle CAD = 100^\circ$$

$$\therefore \angle ABF = 40^\circ \dots\dots\dots 5 \text{ 分}$$

$$\therefore \angle AFD = \angle ABF + \angle BAF = 60^\circ \dots\dots\dots 6 \text{ 分}$$

(3) 在 FB 上截取 $FM=AF$, 连接 AM . 设 AD 与 CF 交于点 N .

由 (1) 得 AE 为 BC 边的垂直平分线

$$\therefore FB=FC, \text{ 又 } AB=AC$$

$$\therefore \angle BFE = \angle CFE$$

$$\angle FBE = \angle FCE, \angle ABE = \angle ACE$$

$$\therefore \angle FBA = \angle FCA$$

$$\because AB=AC, AD=AC$$

$$\therefore AB=AD$$

$$\therefore \angle FBA = \angle D$$

$$\therefore \angle FCA = \angle D$$

$$\because \angle FND = \angle ANC$$

$$\therefore \angle DFC = \angle DAC = 60^\circ$$

$$\therefore \angle BFE = \angle CFE = 60^\circ$$

$$\therefore \triangle FAM \text{ 为等边三角形 } \dots\dots\dots 8 \text{ 分}$$

$$\therefore AM=AF, \angle DMA = \angle VFA = 60^\circ$$

在 $\triangle AMD$ 与 $\triangle AFC$ 中

$$\therefore \begin{cases} \angle DMA = \angle CFA \\ \angle D = \angle FCA \\ AD = AC \end{cases}$$

$$\therefore \triangle AMD \cong \triangle AFC$$

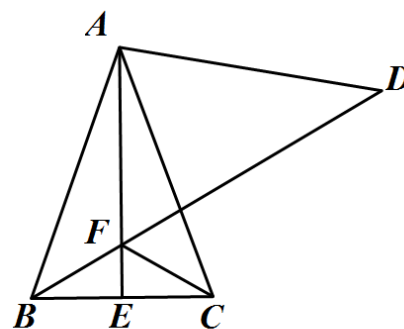
$$\therefore CF=DM=DF+FM=DF+AF \dots\dots\dots 10 \text{ 分}$$

B 卷 (共 50 分)

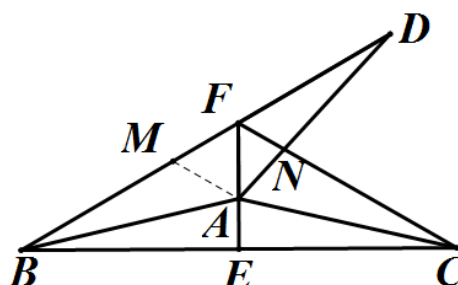
一、填空题(本大题共 5 个小题, 每小题 4 分, 共 20 分, 答案写在答题卡上)

21、12 22、 $\frac{1}{3}$ 23、7.2 24、 $\frac{3^{2019}-1}{2}$ 25、 $\frac{4}{3}$ 或 12

备注: 25 题只填一个答案且正确, 给 2 分.



20题图②



20题图③

二. 解答题(本大题共 3 个小题, 共 30 分, 答案写在答题卡上)

26. (本小题满分 8 分, 每小题 4 分)

解:(1) $\because a+b=4, ab=2$

$$\therefore a^2 + b^2 - 3ab$$

$$= (a+b)^2 - 5ab \dots\dots\dots 3 \text{分}$$

$$= 16 - 10$$

$$= 6 \dots\dots\dots 4 \text{分}$$

$$(2) \because a^2 + a - 1 = 0$$

$$\therefore a^2 + a = 1, a^2 = -a + 1 \dots\dots\dots 1 \text{分}$$

$$\therefore a^3 + 2a^2 + 3 = a \cdot a^2 + 2a^2 + 3$$

$$= a(-a + 1) + 2a^2 + 3$$

$$= a^2 + a + 3 \dots\dots\dots 3 \text{分}$$

$$= 1 + 3$$

$$= 4 \dots\dots\dots 4 \text{分}$$

27. (本小题满分 10 分)

$$(1) \underline{11} ; \quad \underline{9} \dots\dots\dots 2 \text{分}$$

解:(2) 由图知:

$$V_{\text{甲}} = (11-6) \div 0.5 = 10 \text{ (km/h)}$$

$$\therefore a = 11 \div 10 = 1.1 \text{ (小时)} \dots\dots\dots 3 \text{分}$$

$$c = (11+9) \div 10 = 2 \text{ (小时)} \dots\dots\dots 4 \text{分}$$

$$V_{\text{乙}} = 9 \div (1.1 - 0.5) = 15 \text{ (km/h)}$$

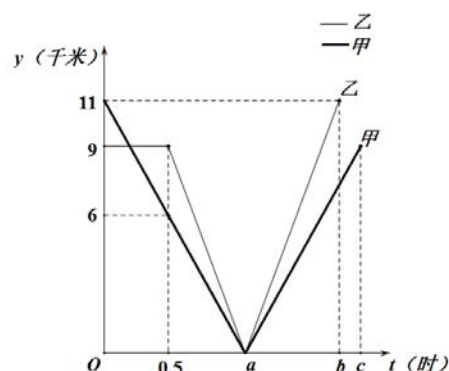
$$\therefore b = 0.5 + (11+9) \div 15 = \frac{11}{6} \text{ (小时)} \dots\dots\dots 6 \text{分}$$

(3) 甲骑自行车从 A 地到 C 地 (即 $0 \leq t \leq 1.1$ 时)

$$y_1 = 11 - 10t \dots\dots\dots 8 \text{分}$$

甲骑自行车从 C 地到 B 地 (即 $1.1 < t \leq 2$ 时)

$$y_1 = 10t - 11 \dots\dots\dots 10 \text{分}$$



28. (本小题满分 12 分)

(1) 证明: $\because \triangle ABC$ 是以 A 为直角顶点的等腰直角三角形, $CD \perp OA$,

$$\therefore \angle BAC = \angle AOB = \angle CDA = 90^\circ, AB = CA.$$

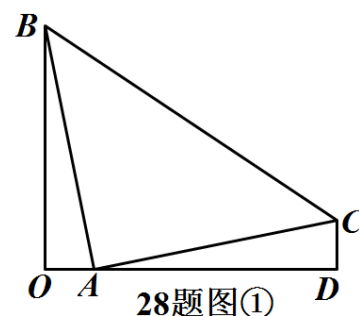
$$\therefore \angle OAB + \angle DAC = \angle OAB + \angle OBA = 90^\circ$$

$$\therefore \angle OBA = \angle DAC \dots\dots\dots 1 \text{分}$$

在 $\triangle AOB$ 与 $\triangle CDA$ 中

$$\therefore \begin{cases} \angle AOB = \angle CDA \\ \angle OBA = \angle DAC \\ AB = CA \end{cases}$$

$$\therefore \triangle AOB \cong \triangle CDA \dots\dots\dots 4 \text{分}$$



(2) 作 $CH \perp CO$ 交 OB 于点 H , 设 AC 、 OB 交于点 G .

$$\because \angle ACB = \angle HCO = \angle AOB = 90^\circ, \angle CGB = \angle OGA.$$

$$\therefore \angle BCH + \angle HCG = \angle ACO + \angle HCG = 90^\circ, \angle HBC + \angle CGB = \angle OAC + \angle OGA = 90^\circ.$$

$$\therefore \angle BCH = \angle ACO, \angle HBC = \angle OAC.$$

在 $\triangle CBH$ 与 $\triangle CAO$ 中

$$\therefore \begin{cases} \angle BCH = \angle ACO \\ \angle CB = CA \\ \angle HBC = \angle OAC \end{cases}$$

$$\therefore \triangle CBH \cong \triangle CAO \dots\dots\dots 6 \text{ 分}$$

$$\therefore CH = CO, \angle AOC = \angle BHC$$

$$\therefore \angle CHO = \angle COH$$

$$\because \angle HCO = 90^\circ$$

$$\therefore \angle CHO = 45^\circ$$

$$\therefore \angle BHC = 135^\circ$$

$$\therefore \angle AOC = \angle BHC = 135^\circ \dots\dots\dots 8 \text{ 分}$$

(此题可过点 C 分别向 OB 、 OA 作垂线)

(3) 在 EC 上截取 $EM = OE$, 连接 OM .

$$\because \text{Rt} \triangle AOB \text{ 中}, OA = OB, OD \perp AB,$$

$$\therefore \angle AOB = 90^\circ$$

$$\therefore \angle AOD = \frac{1}{2} \angle AOB = 45^\circ$$

$$\because \triangle OBC \text{ 为等边三角形}$$

$$\therefore \angle COB = 60^\circ, OC = OB = OA$$

$$\therefore \angle AOC = \angle COB + \angle AOB = 150^\circ$$

$$\therefore \angle OCM = \angle OAE = 15^\circ$$

$$\therefore \angle MEO = \angle AOD + \angle OAE = 60^\circ$$

$$\therefore \triangle OME \text{ 为等边三角形} \dots\dots\dots 10 \text{ 分}$$

$$\therefore OM = OE, \angle MOE = 60^\circ$$

$$\therefore \angle COM = \angle AOC - \angle MOE - \angle AOD = 45^\circ$$

$$\therefore \angle COM = \angle AOE$$

在 $\triangle COM$ 与 $\triangle AOE$ 中

$$\therefore \begin{cases} \angle OC = \angle OA \\ \angle COM = \angle AOE \\ OM = OE \end{cases}$$

$$\therefore \triangle COM \cong \triangle AOE \dots\dots\dots 11 \text{ 分}$$

$$\therefore CM = AE$$

$$\therefore CE = CM + EM = AE + OE = 3 + 2 = 5$$

$$\therefore AC = AE + CE = 3 + 5 = 8 \dots\dots\dots 12 \text{ 分}$$

