

八年级数学期中试卷答案

一、选择题（本大题共 6 小题，每小题 3 分，共 18 分.）

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

二、填空题（本大题共有 10 小题，每小题 3 分，共 30 分.）

7. 70° 8. 12cm 9. E6395 10. 3 11. $\angle ABC = \angle BCD (\angle ACB = \angle CBD)$

12. 105° 13. 36° 14. 45° 15. $\frac{9}{8}\pi$ 16. 1

三、解答题（本大题共有 10 小题，共 102 分.）

17.（本题 12 分）

【解答】（1） $8^2 + 15^2 = x^2$

$$x=17 \quad \dots\dots\dots 4 \text{ 分}$$

$$15^2 + x^2 = 25^2$$

$$x=20 \quad \dots\dots\dots 8 \text{ 分}$$

(2)三角形是直角三角形 $\dots\dots\dots 9 \text{ 分}$

$$\because 10^2 + 24^2 = 576$$

$$26^2 = 576$$

$$\therefore 10^2 + 24^2 = 26^2 \quad \dots\dots\dots 11 \text{ 分}$$

\therefore 图 3 中的三角形是直角三角形 $\dots\dots\dots 12 \text{ 分}$

18.（本题 8 分）

【解答】 $\because \triangle ABC$ 是等边三角形

$$\therefore \angle ABC = 60^\circ \quad AB = BC$$

$$\because BD \perp AC$$

$$\therefore \angle DBC = \frac{1}{2} \angle ABC = 30^\circ \quad \dots\dots\dots 4 \text{ 分}$$

$$\because DB = DE$$

$$\therefore \angle E = \angle DBC$$

$$\therefore \angle E = 30^\circ \quad \dots\dots\dots 8 \text{ 分}$$

19.（本题 8 分）

【解答】证明：（1） $\because AB \parallel CD$ ，

$$\therefore \angle DCA = \angle BAC$$

$$\because \angle DAC = \angle BAC$$

$$\therefore \angle DAC = \angle DCA$$

$$\therefore AD = DC; \quad \dots\dots\dots 4 \text{ 分}$$

$$(2) \because AB \parallel CD$$

$$\therefore \angle B + \angle DCB = 180^\circ, \text{ 且 } \angle B = 90^\circ$$

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

$$\begin{aligned} \because AD = DC, \angle D = 120^\circ, \\ \therefore \angle ACD = 30^\circ \\ \therefore \angle ACB = \angle DCB - \angle DCA = 60^\circ. \dots\dots\dots 8 \text{ 分} \end{aligned}$$

20 (本题 8 分)

【解答】(1) 证明：在 $\triangle ABF$ 与 $\triangle DCE$ 中，
 $\angle E = \angle F, BF = CE, AF = DE.$

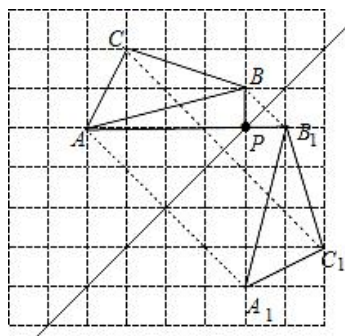
$$\begin{aligned} \therefore \triangle ABF &\cong \triangle DCE \\ \therefore \angle A &= \angle D \\ \therefore AF &\parallel DE \end{aligned} \dots\dots\dots 4 \text{ 分}$$

(2) $\because \triangle ABF \cong \triangle DCE$

$$\begin{aligned} \therefore AB &= CD \\ \therefore AB &= \frac{1}{2}(AD - BC) = \frac{1}{2} \times (17 - 3) = 7 \quad \therefore AC = 10 \end{aligned} \dots\dots\dots 8 \text{ 分}$$

21 (本题 10 分)

【解答】(1) 如图， $\triangle A_1B_1C_1$ 为所作； $\dots\dots\dots 3 \text{ 分}$



(2) 如图，点 P 为所作； $\dots\dots\dots 6 \text{ 分}$

(3) $\triangle A_1B_1C_1$ 的面积等于 $\frac{7}{2}$. $\dots\dots\dots 10 \text{ 分}$

22. (本题 10 分)

【解答】(1) $\because AB \perp BC$

$$\begin{aligned} \therefore AB^2 + BC^2 &= AC^2 \\ \therefore AB^2 + 7^2 &= 25^2 \\ \therefore AC &= 24\text{m}, \end{aligned} \dots\dots\dots 4 \text{ 分}$$

\therefore 梯子顶端 A 距地面 24m 远； $\dots\dots\dots 5 \text{ 分}$

(2) 滑动不等于 4m, $\dots\dots\dots 6 \text{ 分}$

$$\begin{aligned} \because AD &= 4\text{m} \quad \therefore BD = AB - AD = 24 - 4 = 20\text{m} \quad \therefore BD^2 + BE^2 = DE^2 \\ \therefore 20^2 + BE^2 &= 25^2 \\ \therefore BE &= 15\text{m} \end{aligned}$$

$$\therefore CE=BE-BC=8\text{m} \quad \dots\dots\dots 9 \text{ 分}$$

\therefore 梯子低端 C 在水平方向滑动不等于 4 米. $\dots\dots\dots 10 \text{ 分}$

23. (本题 10 分)

【解答】(1)略 $\dots\dots\dots$ (作对第一个得 3 分, 作对 2 个得 5 分)

(2) $\because QE$ 是 BC 的垂直平分线

$$\therefore BE=CE$$

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

$$\therefore AC^2+AB^2=BC^2$$

$$\therefore AC^2+3^2=5^2$$

$$\therefore AC=4\text{cm}$$

$$\therefore C_{\triangle ABE}=AB+BE+AE$$

$$=AB+AC$$

$$=3+4 \quad \dots\dots\dots 9 \text{ 分}$$

$$=7\text{cm}$$

$$\therefore \triangle ABE \text{ 的周长 } 7\text{cm}. \quad \dots\dots\dots 10 \text{ 分}$$

24. (本题 10 分)

【解答】(1) $\because AD \perp CA$

$$\therefore \angle DAE=\angle ACB=90^\circ$$

在 $\triangle ABC$ 与 $\triangle DEA$ 中,

$$AE=BC$$

$$\angle DAE=\angle ACB$$

$$AD=AC$$

$$\therefore \triangle ABC \cong \triangle DEA \quad \dots\dots\dots 3 \text{ 分}$$

(2) $\because \triangle ABC \cong \triangle DEA$

$$\therefore AB=DE, \angle BAC=\angle ADE$$

$$\because \angle BAC+\angle BAD=90^\circ$$

$$\therefore \angle ADE+\angle BAD=90^\circ$$

$$\because \angle DFA+\angle ADE+\angle BAD=90^\circ$$

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

$$\therefore AB \perp DE \quad \dots\dots\dots 6 \text{ 分}$$

$$(3) \quad S_{\text{四边形 AEBD}}=S_{\triangle ABE}+S_{\triangle ABD}=\frac{1}{2}AB \cdot DF+\frac{1}{2}AB \cdot EF=\frac{1}{2}AB \cdot EF=\frac{1}{2}c^2 \quad \dots\dots\dots 8 \text{ 分}$$

$$\because S_{\text{四边形 AEBD}}=\frac{1}{2}a^2+\frac{1}{2}b^2$$

$$\therefore \frac{1}{2}a^2+\frac{1}{2}b^2=\frac{1}{2}c^2$$

$$\therefore a^2+b^2=c^2 \quad \dots\dots\dots 10 \text{ 分}$$

25. (本题 12 分)

【解答】(1)过点 C 作 $CD \perp AB$ 于点 D

$$\because \angle ACB=90^\circ \quad \therefore AC^2+BC^2=AB^2$$

$$\therefore 8^2+BC^2=10^2 \quad \therefore BC=6$$

$$S_{\triangle ABC} = \frac{1}{2} AC \cdot BC = \frac{1}{2} AB \cdot CD \quad \cdots \cdots 2 \text{ 分}$$

$$\therefore 6 \times 8 = 10CD \quad \therefore CD = 4.8 \quad \therefore \text{点 } C \text{ 到边 } AB \text{ 的距离为 } 4.8. \quad \cdots 4 \text{ 分}$$

$$(2) \text{ 连接 } BN \quad \because CD \perp AB \quad \therefore \angle BMN = 90^\circ \quad \therefore \angle BMN = \angle ACB = 90^\circ$$

在 $\triangle BCN$ 与 $\triangle BMN$ 中,

$$CN = MN$$

$$BN = BN$$

$$\therefore \triangle BCN \cong \triangle BMN$$

$$\therefore BC = BM$$

$$\therefore AM = AB - BM = 10 - 6 = 4 \quad \cdots \cdots 7 \text{ 分}$$

$$\therefore AM \text{ 的长为 } 4 \text{ cm} \quad \cdots \cdots 8 \text{ 分}$$

$$(3) \text{ 当 } AM \text{ 为 } 5、4 \text{ 或 } \frac{14}{5} \text{ 时, } \triangle BCM \text{ 为等腰三角形.} \quad \cdots \cdots 9 \text{ 分}$$

$$\textcircled{1} \text{ 当 } BM = CM \text{ 时, } AM = 5 \quad \cdots \cdots 10 \text{ 分}$$

$$\textcircled{2} \text{ 当 } BM = BC \text{ 时, } AM = 4 \quad \cdots \cdots 11 \text{ 分}$$

$$\textcircled{3} \text{ 当 } BC = CM \text{ 时, } AM = \frac{14}{5} \quad \cdots \cdots 12 \text{ 分}$$

26. (本题 14 分)

【解答】(1) $\because AB = BC$

$$\therefore \angle BCA = \angle BAC$$

$$\because AD \parallel BC \quad \therefore \angle BCA = \angle CAD$$

$$\therefore \angle BAC = \angle CAD$$

在 $\triangle ABE$ 与 $\triangle ACD$ 中,

$$\angle AEB = \angle ADC$$

$$\angle BAC = \angle CAD$$

$$AB = AC$$

$$\therefore \triangle ABE \cong \triangle ACD \quad \cdots \cdots 4 \text{ 分}$$

$$(2) \triangle AOF \text{ 是等边三角形} \quad \cdots \cdots 5 \text{ 分}$$

$$\because \triangle ABE \cong \triangle ACD \quad \therefore AE = AD$$

$$\therefore \angle EHO = 60^\circ \quad \therefore \angle EHO = \angle CAD = 60^\circ$$

$$\therefore \angle EHO + \angle HEO = \angle CAD + \angle ADO \quad \therefore \angle HEO = \angle ADO$$

在 $\triangle AEF$ 与 $\triangle ADO$ 中,

$$\angle AEF = \angle ADO$$

$$AE = AD$$

$$\angle FAE = \angle OAD$$

$$\therefore \triangle AEF \cong \triangle ADO$$

$$\therefore AF = AO$$

$$\therefore \angle EAF = 60^\circ \quad \therefore \triangle AOF \text{ 是等边三角形} \quad \cdots \cdots 9 \text{ 分}$$

$$(3) \text{ 方法一 } \angle ADC = \frac{11}{6} \angle BDC \quad \cdots \cdots 10 \text{ 分}$$

$$\because \triangle AEF \cong \triangle ADO \quad \therefore AF = AO \quad EF = OD$$

$$\because \triangle ABE \cong \triangle ACD \quad \therefore AB = AC \quad BE = CD \quad \therefore AB - AF = AC - AO$$

$$\text{即 } BF = OC$$

在 $\triangle BEF$ 与 $\triangle COD$ 中,

$$BF=OC$$

$$EF=OD$$

$$BE=CD$$

$$\therefore \triangle BEF \cong \triangle COD \quad \therefore \angle BEF = \angle CDO$$

$$\because AD \parallel BC \quad \therefore \angle CBD = \angle ADB$$

$$\text{设 } \angle CBD = x \text{ 则 } \angle BEF = \frac{6}{5}x \quad \therefore \angle BDC = \frac{6}{5}x \quad \angle ADB = x$$

$$\therefore \angle ADC = \angle BDC + \angle ADB = \frac{11}{5}x \quad \therefore \angle ADC = \frac{11}{6} \angle BDC \quad \cdots \cdots 14 \text{ 分}$$

$$\text{方法二: } \angle BDC = \frac{11}{6} \angle ADB \quad \cdots \cdots 10 \text{ 分}$$

$$\text{设 } \angle CBD = x \quad \text{则 } \angle BEF = \frac{6}{5}x$$

$$\because AD \parallel BC$$

$$\therefore \angle CBD = \angle ADB = x$$

$$\because \triangle AEF \cong \triangle ADO$$

$$\therefore \angle AEF = \angle ADB = x$$

$$\therefore \angle AEB = \frac{11}{5}x$$

$$\because \triangle ABE \cong \triangle ACD$$

$$\therefore \angle ADC = \angle AEB = \frac{11}{5}x$$

$$\therefore \angle BDC = \frac{6}{5}x$$

$$\therefore \angle ADC = \frac{11}{6} \angle ADB \quad \cdots \cdots 14 \text{ 分}$$