

八年级上学期期中调研试卷

数学(HS)参考答案

2020. 11

一、选择题(每小题 3 分,共 30 分)

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

二、填空题(每小题 3 分,共 15 分)

11. ± 10 12. $4a^5b$ 13. $\frac{1}{2}$ 14. 40° 或 140°

15. 如果一个三角形的三个角都相等,那么这个三角形是等边三角形。

三、解答题(16—23 题,共 75 分)

16. 计算:(每小题 3 分,共 12 分).

$$\begin{aligned}(1) & -\sqrt{36} + \sqrt{2\frac{1}{4}} + \sqrt[3]{27} \\ & = -6 + \frac{3}{2} + 3 \cdots \cdots 2 \text{ 分} \\ & = -\frac{3}{2} \cdots \cdots 3 \text{ 分}\end{aligned}$$

$$\begin{aligned}(2) & x^3(2x^3)^2 \div (-x^4)^2 \\ & = x^3 \cdot 4x^6 \div x^8 \cdots \cdots 1 \text{ 分} \\ & = 4x^9 \div x^8 \cdots \cdots 2 \text{ 分} \\ & = 4x \cdots \cdots 3 \text{ 分}\end{aligned}$$

$$\begin{aligned}(3) & (x-1)(x-3) - (x-1)^2 \\ & = x^2 - 4x + 3 - (x^2 - 2x + 1) \cdots \cdots 1 \text{ 分} \\ & = x^2 - 4x + 3 - x^2 + 2x - 1 \cdots \cdots 2 \text{ 分} \\ & = -2x + 2 \cdots \cdots 3 \text{ 分}\end{aligned}$$

$$\begin{aligned}(4) & (a-2b+3c)(a+2b-3c) \\ & = a^2 - (2b-3c)^2 \cdots \cdots 1 \text{ 分} \\ & = a^2 - (4b^2 - 12bc + 9c^2) \cdots \cdots 2 \text{ 分} \\ & = a^2 - 4b^2 + 12bc - 9c^2 \cdots \cdots 3 \text{ 分}\end{aligned}$$

17. 分解因式(每小题 4 分,共 16 分)

$$\begin{aligned}(1) & 2ax^2 - 8a \\ & = 2a(x^2 - 4) \cdots \cdots 2 \text{ 分}\end{aligned}$$

$$=2a(x+2)(x-2)\cdots\cdots 4 \text{ 分}$$

$$(2)x^2-2xy+y^2-1$$

$$=(x-y)^2-1\cdots\cdots 2 \text{ 分}$$

$$=(x-y+1)(x-y-1)\cdots 4 \text{ 分}$$

$$(3)(x-1)(x-3)+1$$

$$=x^2-4x+3+1\cdots\cdots 2 \text{ 分}$$

$$=x^2-4x+4$$

$$=(x-2)^2\cdots\cdots 4 \text{ 分}$$

$$(4)16x^4-81y^4$$

$$=(4x^2+9y^2)(4x^2-9y^2)\cdots\cdots 2 \text{ 分}$$

$$=(4x^2+9y^2)(2x+3y)(2x-3y)\cdots 4 \text{ 分}$$

$$18. (6 \text{ 分}) (x-3y)(3x-y)-(2y+x)(-2y+x)-(x+2y)(x+2y)$$

$$=3x^2-xy-9xy+3y^2-x^2+4y^2-x^2-4xy-4y^2\cdots\cdots 2 \text{ 分}$$

$$=x^2-14xy+3y^2\cdots\cdots 4 \text{ 分}$$

$$\text{当 } x=2, y=1 \text{ 时}$$

$$\text{原式}=2^2-14\times 2\times 1+3\times 1^2=-21\cdots\cdots 6 \text{ 分}$$

$$19. \text{证明:} \because \angle 1 = \angle 2 \quad \therefore \angle 1 + \angle EAB = \angle 2 + \angle EAB$$

$$\text{即 } \angle CAB = \angle EAD \cdots\cdots 2 \text{ 分}$$

$$\text{在 } \triangle ABC \text{ 和 } \triangle ADE \text{ 中}$$

$$\because AC = AE \quad \angle CAB = \angle EAD \quad AB = AD \cdots\cdots 4 \text{ 分}$$

$$\therefore \triangle ABC \cong \triangle ADE (SAS) \cdots\cdots 5 \text{ 分}$$

$$\therefore BC = DE \cdots\cdots 7 \text{ 分}$$

$$20. \text{解: 由题意得 } x-3 \geq 0 \text{ 且 } 3-x \geq 0 \cdots\cdots 2 \text{ 分}$$

$$\therefore x=3 \cdots\cdots 4 \text{ 分}$$

$$y=2 \cdots\cdots 5 \text{ 分}$$

$$x+3y=3+3\times 2=9 \cdots\cdots 6 \text{ 分}$$

$\therefore x+3y$ 的平方根为 ± 37 分

21. 解:(1) $\because x^2y - xy^2 - x + y = 65$

$$xy(x-y) - (x-y) = 65$$

$$(x-y)(xy-1) = 65 \dots\dots 2 \text{ 分}$$

$$\text{又} \because xy = 14$$

$$\therefore x-y = 5 \dots\dots 4 \text{ 分}$$

$$\therefore x^2 + y^2 = (x-y)^2 + 2xy = 5^2 + 28 = 53 \dots\dots 7 \text{ 分}$$

$$(2) \because (x+y)^2 = x^2 + y^2 + 2xy = 53 + 28 = 81 \dots\dots 9 \text{ 分}$$

$$\therefore x+y = \pm 9 \dots\dots 10 \text{ 分}$$

22. 解:(1) $\because a^2 + b^2 = 4a + 10b - 29$

$$\therefore a^2 + b^2 - 4a - 10b + 29 = 0$$

$$a^2 + b^2 - 4a - 10b + 4 + 25 = 0$$

$$(a^2 - 4a + 4) + (b^2 - 10b + 25) = 0 \dots\dots 2 \text{ 分}$$

$$(a-2)^2 + (b-5)^2 = 0$$

$$\therefore a = 2 \quad b = 5 \dots\dots 3 \text{ 分}$$

$\because a, b, c$ 是 $\triangle ABC$ 的三边

$$\therefore 3 < c < 7 \dots\dots 4 \text{ 分}$$

\therefore 整数 c 为 4 或 5 或 6.....5 分

(2) $\because \triangle ABC$ 是等腰三角形

$$\therefore a = 2 \quad b = 5 \quad c = 5 \dots\dots 6 \text{ 分}$$

$$\therefore \text{周长为 } 2 + 5 + 5 = 12 \dots\dots 7 \text{ 分}$$

23. (1) 证明: $\because \angle BAC = 90^\circ \therefore \angle BAE + \angle EAC = 90^\circ$

$$\because BD \perp AE \quad \therefore \angle BAE + \angle ABD = 90^\circ$$

$$\therefore \angle ABD = \angle EAC \dots\dots 1 \text{ 分}$$

在 $\triangle ABD$ 和 $\triangle ACE$ 中

$$\because \angle ABD = \angle EAC \quad \angle ADB = \angle AEC = 90^\circ \quad AB = AC$$

$$\therefore \triangle ABD \cong \triangle ACE (\text{AAS}) \cdots \cdots 3 \text{ 分}$$

$$\therefore BD = AE \quad AD = CE$$

$$\therefore BD = AE = AD + DE = CE + DE \cdots \cdots 4 \text{ 分}$$

$$(2) BD = DE - CE \cdots \cdots 5 \text{ 分}$$

$$\text{理由: } \because \angle BAC = 90^\circ \quad \therefore \angle BAD + \angle EAC = 90^\circ$$

$$\because BD \perp AE \quad \therefore \angle BAD + \angle ABD = 90^\circ$$

$$\therefore \angle ABD = \angle EAC$$

在 $\triangle ABD$ 和 $\triangle ACE$ 中

$$\because \angle ABD = \angle EAC \quad \angle ADB = \angle AEC = 90^\circ \quad AB = AC$$

$$\therefore \triangle ABD \cong \triangle ACE (\text{AAS}) \cdots \cdots 6 \text{ 分}$$

$$\therefore BD = AE \quad AD = CE$$

$$\therefore BD = AE = DE - AD = DE - CE \cdots \cdots 8 \text{ 分}$$

$$(3) BD = DE - CE \cdots \cdots 10 \text{ 分}$$

附加题(10 分)

三角形 ABC 是等边三角形。理由如下:

$$\because a^2 + b^2 + c^2 = ab + bc + ca$$

$$\therefore a^2 + b^2 + c^2 - ab - bc - ca = 0$$

$$2a^2 + 2b^2 + 2c^2 - 2ab - 2bc - 2ca = 0 \cdots \cdots 2 \text{ 分}$$

$$(a^2 - 2ab + b^2) + (b^2 - 2bc + c^2) + (c^2 - 2ca + a^2) = 0 \cdots \cdots 4 \text{ 分}$$

$$(a - b)^2 + (b - c)^2 + (c - a)^2 = 0 \cdots \cdots 6 \text{ 分}$$

$$\therefore a - b = 0 \text{ 且 } b - c = 0 \text{ 且 } c - a = 0$$

$$\therefore a = b = c \cdots \cdots 8 \text{ 分}$$

$$\because a, b, c \text{ 是三角形 ABC 的三边}$$

$$\therefore \text{三角形 ABC 是等边三角形} \cdots \cdots 10 \text{ 分}$$