

2025-2026 学年七年级下学期期中模拟卷

数学·参考答案

一、选择题：(本大题共 6 题，每题 2 分，满分 12 分)

题号	1	2	3	4	5	6
答案	A	B	C	C	B	D

二、填空题：(本大题共 12 题，每题 3 分，满分 36 分)

7. $<$ 8. -3 9. $x < 2$ 10. $2m + n \leq 3$ 11. $\frac{x}{10} + \frac{x}{12} \geq 1$ 12. 40 或 140
13. 54 14. 50° 15. 如果两个角是同一个角的补角，那么这两个角相等 16. 47° 17. 140° 18. $-2 < m \leq -1$

三、解答题 (本大题共 8 题，满分 52 分)

19. (本题 6 分) 解: $\frac{2x+1}{3} - 3 < \frac{x-5}{2}$,

去分母得, $2(2x+1) - 18 < 3(x-5)$,

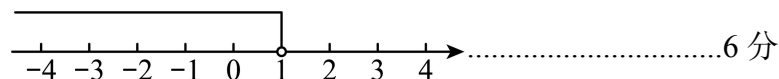
去括号得, $4x+2-18 < 3x-15$,2 分

移项得, $4x-3x < -15+18-2$,

合并同类项得: $x < 1$,

即不等式的解集为 $x < 1$5 分

将不等式的解集在数轴上表示为:



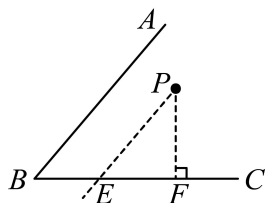
20. (本题 6 分) 解: $\begin{cases} x+2(1-2x) \geq -4 \textcircled{1} \\ \frac{3+5x}{2} > x-1 \textcircled{2} \end{cases}$,

解不等式①, 得: $x \leq 2$,2 分

解不等式②, 得: $x > -\frac{5}{3}$,】 4 分

$\therefore$ 原不等式组的解集为 $-\frac{5}{3} < x \leq 2$6 分

21. (本题 6 分) (1) 解: 射线 $PE \parallel AB$, 交 BC 于 E , 如图所示:



.....2 分

(2) 解: 线段 $PF \perp BC$, 交 BC 于 F , 如图所示;4 分

(3) 解: 由 $PF \perp EF$ 可得点 E 到直线 PF 的距离是线段 EF 的长.6 分

22. (本题 6 分) (1) 解: $\because OE \perp CD$,

$$\therefore \angle DOE = 90^\circ,$$

$$\therefore \angle DOF = \angle DOE - \angle EOF = 54^\circ.$$

$\because OF$ 平分 $\angle AOD$,

$$\therefore \angle AOD = 2\angle DOF = 108^\circ,$$

$$\therefore \angle AOC = 180^\circ - \angle AOD = 72^\circ.3 分$$

(2) 解: $\because \angle EOF$ 比 $\angle AOE$ 大 12° ,

$$\therefore \angle EOF = \angle AOE + 12^\circ,$$

$$\therefore \angle AOF = \angle AOE + \angle EOF = \angle AOE + \angle AOE + 12^\circ = 2\angle AOE + 12^\circ.$$

$\because OF$ 平分 $\angle AOD$,

$$\therefore \angle DOF = \angle AOF = 2\angle AOE + 12^\circ.$$

$$\because \angle EOF + \angle DOF = 90^\circ,$$

$$\therefore \angle AOE + 12^\circ + 2\angle AOE + 12^\circ = 90^\circ,$$

解得 $\angle AOE = 22^\circ$,

$$\therefore \angle AOF = 2\angle AOE + 12^\circ = 56^\circ,$$

$$\therefore \angle BOD = 180^\circ - 2\angle AOF = 68^\circ.6 分$$

23. (本题 6 分) 解: $\because \angle A + \angle ABC = 180^\circ$ (已知),

$\therefore AD \parallel BC$ (同旁内角互补, 两直线平行),1 分

$\therefore \angle 1 = \angle 3$ (两直线平行, 内错角相等),2 分

又 $\because BD \perp CD, EF \perp CD$ (已知),

$\therefore BD \parallel EF$ (同一平面内垂直于同一直线的两直线平行),4 分

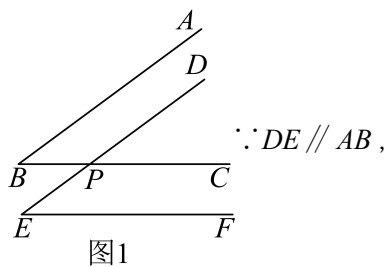
$\therefore \angle 2 = \angle 3$ (两直线平行, 同位角相等),6 分

$\therefore \angle 1 = \angle 2$ (等量代换)

24. (本题 6 分) (1) 解: $\angle ABC$ 与 $\angle DEF$ 相等或互补.....1 分

理由如下:

如图 1,



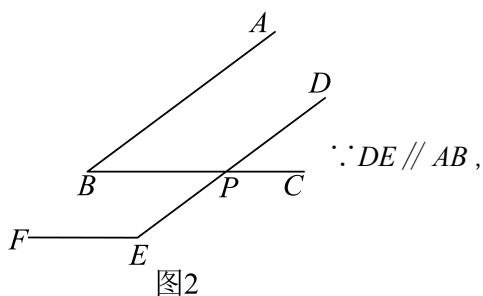
$$\therefore \angle ABC = \angle DPC,$$

$$\because EF \parallel BC,$$

$$\therefore \angle DEF = \angle DPC,$$

$$\therefore \angle ABC = \angle DEF, \dots\dots\dots 2 \text{ 分}$$

如图 2,



$$\therefore \angle ABC + \angle DPB = 180^\circ,$$

$$\because EF \parallel BC,$$

$$\therefore \angle DEF = \angle DPB,$$

$$\therefore \angle ABC + \angle DEF = 180^\circ,$$

综上所述, $\angle ABC$ 与 $\angle DEF$ 相等或互补; $\dots\dots\dots 3 \text{ 分}$

(2) $\because \angle ABC$ 与 $\angle DEF$ 相等或互补,

$$\therefore 2x + 24 = 3y + 36 \text{ 或 } 2x + 24 + 3y + 36 = 180,$$

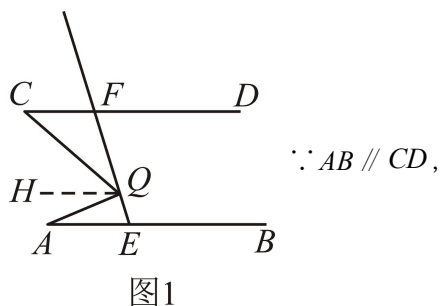
$$\therefore x - 3y = 6,$$

$$\therefore \begin{cases} 2x + 24 = 3y + 36 \\ x - 3y = 6 \end{cases} \text{ 或 } \begin{cases} 2x + 24 + 3y + 36 = 180 \\ x - 3y = 6 \end{cases},$$

$$\text{解得: } \begin{cases} x = 6 \\ y = 0 \end{cases} \text{ 或 } \begin{cases} x = 42 \\ y = 12 \end{cases}, \dots\dots\dots 6 \text{ 分}$$

$$\therefore x = 6, y = 0 \text{ 或 } x = 42, y = 12.$$

25. (本题 8 分) (1) 解: 过点 Q 作 $QH \parallel AB$,



$\therefore QH \parallel AB \parallel CD$,

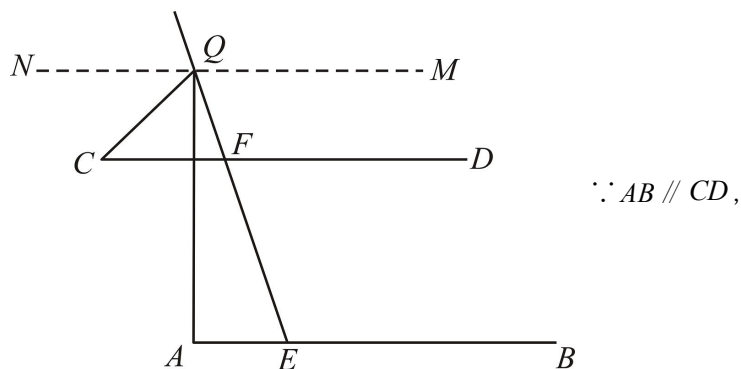
$\therefore \angle C = \angle CQH = 35^\circ$, $\angle A = \angle HQA = 22^\circ$,

$\therefore \angle AQC = \angle CQH + \angle HQA = 35^\circ + 22^\circ = 57^\circ$,

故答案为: 57° ;2 分

(2) 数量关系: $\angle A - \angle C = \angle AQC$,

证明: 过点 Q 作 $MN \parallel CD$,

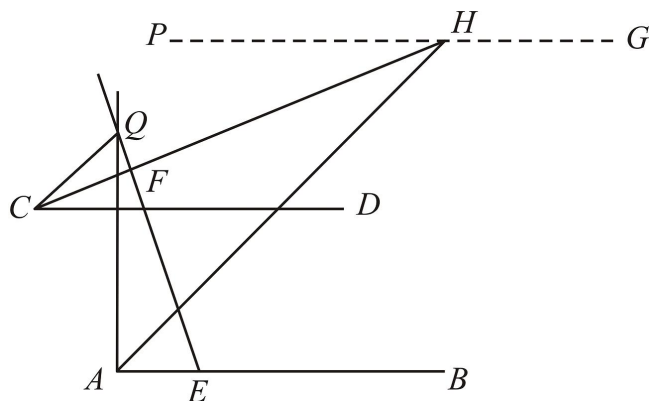


$\therefore AB \parallel MN$,

$\therefore \angle NQC = \angle C$, $\angle MQA = 180^\circ - \angle A$,

$\therefore \angle AQC = 180^\circ - \angle NQC - \angle MQA = \angle A - \angle C$4 分

(3) ①过点 H 作 $PG \parallel CD$,



$\therefore AB \parallel CD$,

$$\therefore AB \parallel PH,$$

$$\therefore \angle PHC = \angle HCD, \quad \angle GHA = 180^\circ - \angle HAB,$$

$$\therefore \angle AHC = \angle HAB - \angle HCD.$$

又 $\because AH$ 平分 $\angle CAB$, CH 平分 $\angle QCD$,

$$\therefore \angle HAB = \frac{1}{2} \angle QAB, \quad \angle HCD = \frac{1}{2} \angle QCD$$

$$\therefore \angle AHC = \frac{1}{2} (\angle QAB - \angle QCD)$$

由 (2) 可得 $\angle AHC = \frac{1}{2} \angle AQC$6 分

② $\angle AQC = 72^\circ$, 理由如下:

$$\because \angle QCH : \angle DCH = 1:3, \quad \angle HCD = 33^\circ, \quad \angle AHC = 25^\circ,$$

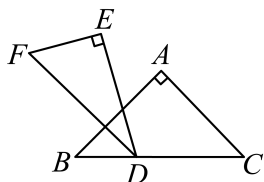
$$\therefore \angle QCH = 11^\circ, \quad \angle DCH = 33^\circ,$$

$$\therefore \angle HAB = 33^\circ + 25^\circ = 58^\circ,$$

$$\therefore \angle AQC = 58^\circ \times 2 - 44^\circ = 72^\circ,$$

故答案为: 72°8 分

26. (本题 8 分) (1) 如下图所示,

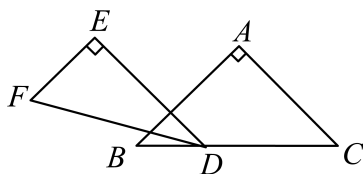


要使得 $DF \parallel AC$,

$$\text{则 } \angle BDF = \angle C = 45^\circ,$$

$$\therefore \text{当 } \alpha = 45^\circ \text{ 时, } DF \parallel AC;$$

如下图所示,



要使得 $DE \perp AB$,

则 $DE \parallel AC$,

$$\therefore \angle BDE = \angle C = 45^\circ,$$

$$\text{又 } \because \angle EDF = 30^\circ,$$

$$\therefore \angle BDF = \angle BDE - \angle EDF = 15^\circ,$$

即当 $\alpha = 15^\circ$ 时, $DE \perp AB$,

故答案为: $45^\circ, 15^\circ$;3 分

(2) ① $\because \alpha = 30^\circ$, 即 $\angle BDF = 30^\circ$, $\angle EDF = 30^\circ$

$$\therefore \angle CDM = \angle BDF = 30^\circ, \angle BDN = \angle BDF + \angle EDF = 60^\circ,$$

$$\therefore \angle 2 = \angle BND = 180^\circ - \angle B - \angle BDN = 75^\circ,$$

又 $\because \angle ACB = 45^\circ$,

$$\therefore \angle BCM = 180^\circ - \angle ACB = 135^\circ,$$

$$\therefore \angle 1 = \angle CMD = 180^\circ - \angle BCM - \angle CDM = 15^\circ,$$

$$\therefore \angle 2 - \angle 1 = 60^\circ; \text{5 分}$$

② 当 $0^\circ < \alpha < 45^\circ$ 时,

同理: $\because \angle BDF = \alpha$, $\angle EDF = 30^\circ$

$$\therefore \angle CDM = \angle BDF = \alpha, \angle BDN = \angle BDF + \angle EDF = \alpha + 30^\circ,$$

$$\therefore \angle 2 = \angle BND = 180^\circ - \angle B - \angle BDN = 105^\circ - \alpha,$$

又 $\because \angle ACB = 45^\circ$,

$$\therefore \angle BCM = 180^\circ - \angle ACB = 135^\circ,$$

$$\therefore \angle 1 = \angle CMD = 180^\circ - \angle BCM - \angle CDM = 45^\circ - \alpha,$$

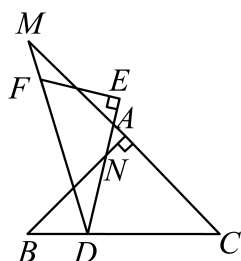
$$\therefore 3\angle 1 + \angle 2 = 3(45^\circ - \alpha) + (105^\circ - \alpha) = 240^\circ - 4\alpha < 160^\circ$$

解得: $\alpha > 20^\circ$,

$$\therefore 20^\circ < \alpha < 45^\circ, \text{6 分}$$

当 $\alpha = 45^\circ$, $FD \parallel AC$, 此时不合题意;

当 $45^\circ < \alpha \leq 60^\circ$ 时, DF 的延长线与 CA 的延长线无交点, 如下图所示:



同理可得: $\angle 2 = 105^\circ - \alpha$,

$$\therefore \angle BDF = \alpha,$$

$$\therefore \angle CDM = 180^\circ - \alpha,$$

$$\therefore \angle 1 = \angle CMD = 180^\circ - \angle C - \angle CDM = a - 45^\circ,$$

$$\therefore 3\angle 1 + \angle 2 = 3(a - 45^\circ) + (105^\circ - a) = 2a - 30^\circ < 160^\circ,$$

$$\text{解得: } a < 95^\circ,$$

$$\therefore 45^\circ < a \leq 60^\circ,$$

综上所述: a 的取值范围是 $20^\circ < a \leq 60^\circ$ 且 $a \neq 45^\circ$8 分