



# 北京市平谷区 2020 年中考统一练习（二） 数学试卷参考答案及评分标准

2020.6

## 一、选择题（本题共 16 分，每小题 2 分）

题号	1	2	3	4	5	6	7	8
答案	D	B	A	B	C	C	A	D

## 二、填空题（本题共 16 分，每小题 2 分）

9.  $y(x+3)(x-3)$ ;    10.  $45^\circ$ ;    11.  $x \geq 1$ ;    12.  $\leq$ ;  
 13. 答案不唯一, 如  $y = 2x + 2$ ;    14. 答案不唯一, 如  $a = -1$ ;    15.  $\begin{cases} x+y=4 \\ x-y=2 \end{cases}$ ; 或  $(xy=3)$   
 16. 方案四.

## 三、解答题（本题共 68 分，第 17-21 题，每小题 5 分，第 22-27 题，每小题 6 分，第 28 题 7 分）解答应写出文字说明、演算步骤或证明过程.

17. 解: 原式  $= 2 \times \frac{\sqrt{3}}{2} - 1 + 2 - 2\sqrt{3}$  ..... 4

$= 1 - \sqrt{3}$  ..... 5

18. 解: 由①得  $2x - 6 < x - 4$   
 $x < 2$  ..... 1  
 由②得  $x - 1 < 2x$  ..... 2  
 $x > -1$  ..... 3  
 $\therefore -1 < x < 2$  ..... 5

19. (1) 补全图形; ..... 2

(2)

证明: 连接 BP

$\because AB = BC$

$\therefore \widehat{AB} = \widehat{BC}$

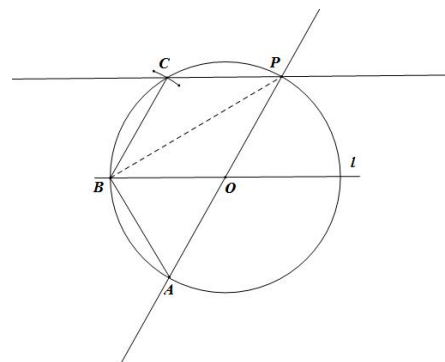
$\therefore \angle CPB = \angle APB$ , ..... 3

又  $\because OB = OP$ ,

$\therefore \angle APB = \angle OBP$ , ..... 4

$\therefore \angle CPB = \angle OBP$ ,

$\therefore CP \parallel l$  (内错角相等两直线平行) ..... 5



20. 解: (1)  $\Delta = (k-1)^2 - 4(k-2)$  ..... 1



$$= (k-3)^2$$

$$\therefore \Delta \geq 0$$

∴ 方程总有两个不相等的实数根.....3

(2) 当 $k=2$

$$\therefore x^2 + x = 0 \dots\dots\dots 4$$

解得  $x_1=0$ ,  $x_2=-1$ . ..... 5

(其他取法相应给分)

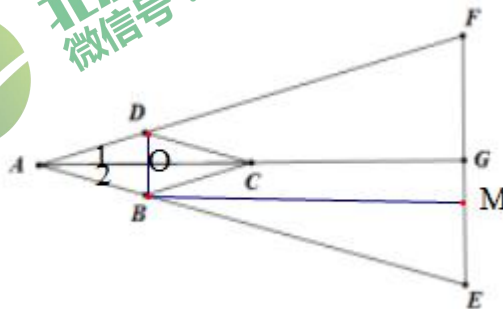
21. (1)证明:  $\because$  四边形 ABCD 是菱形

$$\therefore \angle 1 = \angle 2, AD = AB \dots\dots\dots 1$$

$$\therefore BC=DF$$

$$\therefore AE = AF$$

$$\therefore AG \perp EF$$



(2) 证明:  $\because$  菱形  $ABCD$

$$\therefore BD \perp AC$$

$$\therefore BM \perp EF, AG \perp EF$$

$$\therefore \angle BOG = \angle OGM = \angle GMB = 90^\circ$$

∴ 四边形 OBMG 是矩形.....3

$\because C$  为  $AG$  中点,

$$\therefore \frac{AO}{AG} = \frac{BO}{EG} = \frac{1}{4}$$

$$\therefore BD=2$$

$$\therefore GE = 4$$

$$\therefore GM=OB=1$$

$$\therefore ME=3$$

22. (1)证明:

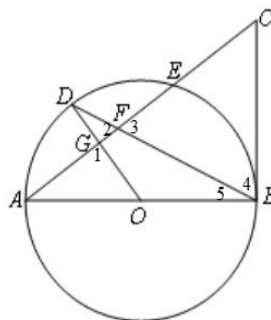
∵ 半径  $OD \perp AE$

$$\therefore \angle 1 = 90^\circ \dots\dots\dots 1$$

$$\therefore \angle 2 + \angle D = 90^\circ$$

$$\therefore FC = BC$$

$$\therefore \angle 3 = \angle 4 = \angle 2 \dots\dots\dots 2$$





$\because OD=OB,$   
 $\therefore \angle 5=\angle D$   
 $\therefore \angle 4+\angle 5=90^\circ$   
 $\therefore \angle ABC=90^\circ$   
 $\therefore BC$  与  $\odot O$  相切.....3

(2) 解:  $\because \angle 1=90^\circ$ , 半径为 5,  $\tan A = \frac{3}{4}$

$\therefore OG=3, AG=4$ .....4

$\because \angle 1=\angle ABC=90^\circ, \angle A=\angle A$

$\therefore \triangle AGO \sim \triangle ABC$

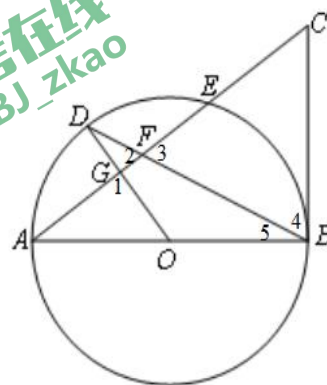
$\therefore \frac{OG}{BC} = \frac{AO}{AC} = \frac{AG}{AB}$

$\therefore \frac{3}{BC} = \frac{5}{AC} = \frac{4}{10}$

$\therefore BC = \frac{15}{2}, AC = \frac{25}{2}$  .....5

$\therefore FC = \frac{15}{2}$

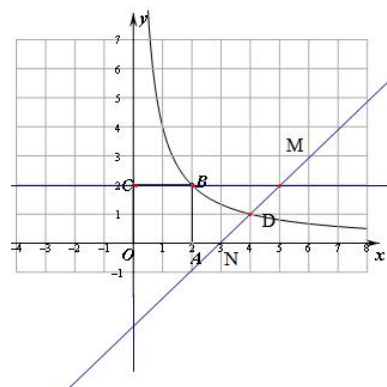
$\therefore GF=1$ .....6



23. (1) B (2,2) ..... 1  
 $k=4$  ..... 2  
 (点 B 坐标不写不扣分)

(2) 如图, D (4,1) .....3

代入得,  $b=-3$ .....4



(3)  $b > 3$  .....6

24. (1)  $a=12, b=0.32$  ..... 2



(2)略..... 3

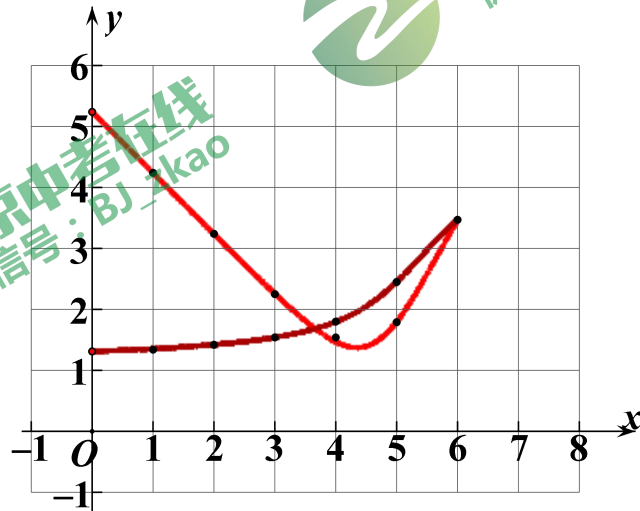
(3)23..... 4

(4)  $500 \times 0.32 = 160$  (人)..... 6

(计算过程没写不扣分)

25.解：(1) 2.33 (2.0-2.5 之间均给分)..... 1

(2)



..... 3

(3) 3.7cm、4.6cm、4.2cm..... 6

26. (1)  $x = -\frac{b}{2a} = 1$ ..... 1

C (0, -1)..... 2

(2)① 1 个..... 3

②当抛物线顶点为 (1, -2) 时,  $m=1$

当抛物线顶点为 (1, -3) 时,  $m=2$

所以,  $1 < m \leq 2$ ..... 6



27. (1) 补全图形..... 1

(2)  $60^\circ$  ..... 2

(3) 当  $\angle AMD = 75^\circ$  时结论成立.

证明：想法一：

过 A 作  $AE \perp CD$  于 E.

$$\because \angle B = \angle C = \angle E = 90^\circ$$

$$AB = BC$$

$\therefore$  四边形 ABCE 是正方形..... 4

$$\therefore AB = AE, \angle B = \angle E,$$

$$BC = CE$$

$$\therefore MC = DC$$

$$\therefore BM = DE$$

$\therefore \triangle ABM \cong \triangle AED$  ..... 5

$$\therefore AD = AM$$

$$\therefore \angle AMD = 75^\circ$$

$\therefore \triangle AMD$  是等边三角形

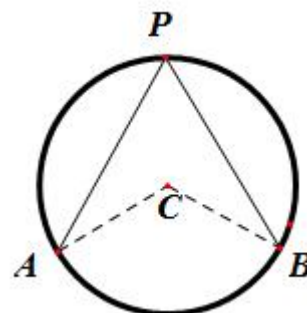
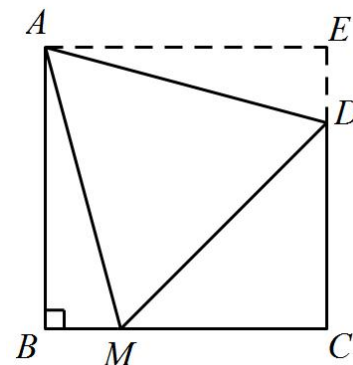
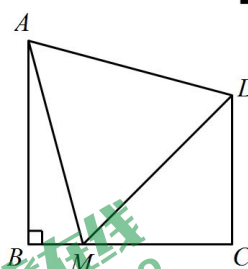
$$\therefore AM = DM$$

..... 6

(其他证明方法类似给分，辅助线正确写出一个正确语句即给 1 分，证完全等 2 分，完全正确 3 分)

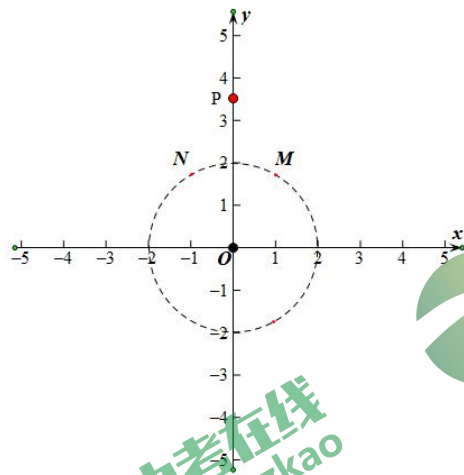
28. (1) 补全图形..... 1

$120^\circ$  ..... 1





(2) ①  $P(0, 2\sqrt{3})$  或  $(0, 0)$  ..... 4



②  $-2 \leq m \leq 2$  ..... 7

