2023年高新区学考模拟测试数学试题



参考答案及评分标准2023.02

一、选择题

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 题号 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 答案 | *A* | *D* | *D* | *C* | *D* | *A* | *D* | *B* | *B* | *C* |

二、填空题:（本大题共6个小题，每小题4分，共24分．）

11．（3﹣2*x*）（3+2*x*）． 12．． 13．1． 14．4043． 15．*y*＝3.6*x*﹣5.2． 16．①②③④．

三、解答题:（本大题共12个小题，共78分．解答应写出文字说明、证明过程或演算步骤．）

17．（本题6分）解：原式＝1+4·············································································4分

····························································································6分

18．（本题6分）解：解不等式①，得*x*＜3·············································································2分

解不等式②，得*x*≥﹣2····································································································4分

∴该不等式组的解集为﹣2≤*x*＜3·······················································································5分

把该不等式组的解集在数轴上表示为：菁优网：http://www.jyeoo.com·······································6分

19．（本题6分）证明：在▱*ABCD*中，*AB*＝*CD*，∠*A*＝∠*C*····················································2分

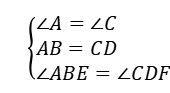
∵*AB*∥*CD*，

∴∠*ABD*＝∠*CDB*·········································································································3分

∵*BE*平分∠*ABD*，*DF*平分∠*CDB*，

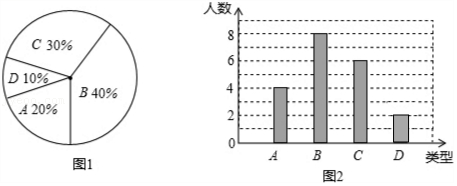
∴∠*ABE*∠*ABD*，∠*CDF*∠*CDB*········································································4分

∴∠*ABE*＝∠*CDF*·········································································································5分

在△*ABE*和△*CDF*中，

∴△*ABE*≌△*CDF*·········································································································6分

20．（本题8分）解：（1）完整的条形统计图如图所示：

·······························································································2分

（2）答案为：4；4·······································································································4分

（3）①小宇错在第二步··································································································5分

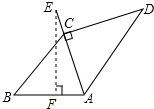
②（棵）···········································································6分

估计360名学生共植树360×4.3＝1548（棵）·······································································8分

21．（本题8分）解：（1）在Rt△*ACD*中，∠*ACD*=90°，*AC*＝45*cm*，*DC*＝60*cm*·······················1分

∵*AD*2=*AC*2+*CD*2···········································································································2分

∴*AD*75（*cm*），

∴车架档*AD*的长是75*cm*································································································3分

（2）过点*E*作*EF*⊥*AB*，垂足为*F*····················································································4分

∵*AE*＝*AC*+*CE*＝（45+20）*cm*··························································································5分

在Rt△*AEF*中，∠*AFE*=90°···························································································6分

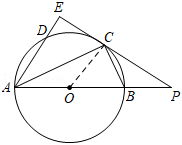
∴*EF*＝*AE*sin75°···········································································································7分

＝（45+20）sin75°≈62.7835≈63（*cm*）·······································································8分

∴车座点*E*到车架档*AB*的距离约是63*cm*．

22．（本题8分）（1）证明：连接*OC*，

∵直线*EP*与圆相切于点*C*，

∴*OC*⊥*PE*····················································································································1分

∵*AE*⊥*PE*，

∴*OC*∥*AE*

∴∠*DAC*＝∠*OCA*·········································································································2分

∵*OA*＝*OC*，

∴∠*OCA*＝∠*OAC*·········································································································3分

∴∠*DAC*＝∠*OAC*，

∴*AC*平分∠*BAD*··········································································································4分

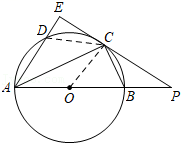
（2）∵*AB*是⊙*O*的直径，

∴∠*ACB*＝90°

在Rt△*ABC*中，················································································5分

在Rt△*ABC*和Rt△*ACE*中，

∵∠*DAC*＝∠*BAC*，∠*AEC*＝∠*ACB*＝90°，

∴Rt△*ABC*∽Rt△*ACE*，

∴，即，

∴*EC*＝4.8···················································································································6分

连接*CD*，

∴*CD*＝*BC*＝6··············································································································7分

在Rt△*DCE*中，·························································8分

23．（本题10分）解：（1）设酒精消毒液和测温枪每件的进价分别是*x*元，*y*元·····························1分

由题意可得：······················································································3分

解得：·············································································································5分

答：酒精消毒液的进价为12元，测温枪的进价为180元························································6分

（2）设购进酒精消毒液*a*件，则购进测温枪（1000﹣*a*）件，销售完这1000件商品获得的利润为*W*，

由题意可得：

*W*＝（20﹣12）*a*+（240﹣180）（1000﹣*a*）＝60000﹣52*a*·······················································8分

∵酒精消毒液的数量不少于测温枪数量的4倍，

∴*a*≥4（1000﹣*a*），

解得：*a*≥800·················································································································9分

∵利润*W*是关于*a*的一次函数，同时﹣52＜0，

∴*W*随着*a*的增大而减小，

∴当*a*＝800时，*W*有最大值为18400，

∴该公司销售完这1000件商品获得的最大利润为18400元···················································10分

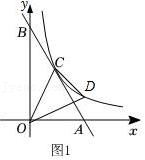
24．（本题10分）解：（1）点*C*（1，*n*）代入解方程组，解得*n=*2······························1分

点*C*（1，2）代入，解得*k*=2·······················································································2分

所以···················································································································3分

（2）如图1，存在，

对于*y*＝−2*x*+4，令*y*＝0，则−2*x*+4＝0，

解得*x*＝2，

令*x*＝0，则*y*＝4，

∴*A*（2，0），*B*（0，4），

设点*D*坐标为（*a*，）···································································································4分

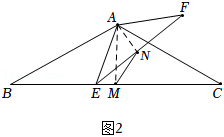
∵*S*△*OCDS*△*AOB*，

∴（2）|*a*﹣1|2×4·····················································································5分

解得*a*＝1或*a*＝﹣1（负值舍去）·········································································6分

∴点*D*坐标为（1，22）或（﹣1，22）···················································8分

（3）*N*（，）··························································································10分

25．（本题12分）解：（1）答案为：；60··········································································2分

（2）结论成立··············································································································3分

理由：如图2中，连接*AM*，*AN*．

∵*AB*＝*AC*，点*M*是边*BC*的中点

∴*AM*⊥*CM*··················································································································4分

∵∠*BAC*＝120°，

∴∠*B*＝∠*C*＝30°，

∴∠*BAM*＝60°·············································································································5分

∴*AB*＝2*AM*·················································································································6分

同法可证*AE*＝2*AN*，∠*EAN*＝60°，

∴∠*BAM*＝∠*EAN*＝60°，

∴∠*BAE*＝∠*MAN*·········································································································7分

∵2············································································································8分

∴△*BAE*∽△*MAN*，

∴∠*B*＝∠*AMN*＝30°，2···············································································10分

∴，∠*NMC*＝60°，即直线*BE*与*MN*相交所成的锐角的度数为60°；

（3）答案为：2·······································································································12分

26．（本题12分）解：（1）由题意得：·······························································2分

解得，

抛物线的表达式为*y*＝*x*2﹣5*x*+4·····························································3分

（2）对于*y*＝*x*2﹣5*x*+4，令*y*＝*x*2﹣5*x*+4＝0，解得*x*＝1或4，令*x*＝0，则*y*＝4，

故点*B*的坐标为（4，0），点*C*（0，4），

设直线*BC*的表达式为*y*＝*kx*+*t*，则，解得，

故直线*BC*的表达式为*y*＝﹣*x*+4，

设点*P*的坐标为（*x*，﹣*x*+4），则点*Q*的坐标为（*x*，*x*2﹣5*x*+4）·············································5分

则*PQ*＝（﹣*x*+4）﹣（*x*2﹣5*x*+4）＝﹣*x*2+4*x*，

∵﹣1＜0，

故*PQ*有最大值，当*x*＝2时，*PQ*的最大值为4＝*CO*····························································6分

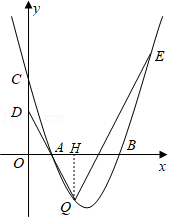
此时点*Q*的坐标为（2，﹣2）··························································································7分

∵*PQ*＝*CO*，*PQ*∥*OC*，

故四边形*OCPQ*为平行四边形··························································································8分

（3）∵*D*是*OC*的中点，则点*D*（0，2），

由点*D*、*Q*的坐标，同理可得，直线*DQ*的表达式为*y*＝﹣2*x*+2，

过点*Q*作*QH*⊥*x*轴于点*H*，

则*QH*∥*CO*，故∠*AQH*＝∠*ODA*，

而∠*DQE*＝2∠*ODQ*．

∴∠*HQA*＝∠*HQE*，

则直线*AQ*和直线*QE*关于直线*QH*对称，

故设直线*QE*的表达式为*y*＝2*x*+*r*，

将点*Q*的坐标代入上式并解得*r*＝﹣6，

故直线*QE*的表达式为*y*＝2*x*﹣6②，

联立①②并解得（不合题意的值已舍去），

故点*E*的坐标为（5，4）································································································9分

设点*F*的坐标为（0，*m*），

由点*B*、*E*的坐标得：*BE*2＝（5﹣4）2+（4﹣0）2＝17，

同理可得，当*BE*＝*BF*时，即16+*m*2＝17，解得*m*＝±1；

当*BE*＝*EF*时，即25+（*m*﹣4）2＝17，方程无解；

当*BF*＝*EF*时，即16+*m*2＝25+（*m*﹣4）2，解得*m*；

故点*F*的坐标为（0，1）或（0，﹣1）或（0，）····························································12分

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