1. B
2. E
3. E
4. C
5. A
6. A
7. D
8. C
9. D
10. D
11. B
12. E
13. B
14. A or D
15. B
16. A
17. C
18. C
19. A
20. D
21. B **(Thrown Out at Convention)**
22. A
23. A
24. D
25. D
26. D
27. E
28. C
29. E
30. A
31. The smallest value of is obtained, when and onlyare used to find the value of . Since ,  . 
32. Remember the first Fermat Number occurs when. The only combination that doesn’t produce a product less than  is  . Hence the probability is  .
33. 



1. All the answer choices describe the imaginary plane except for C
2. 
3. The common ratio is  , thus 
4. 
5. 
6. 
7. Let  , then 

 Hence  and it is known, for any circle, 

1. If  then  . Hence  and 
2. 
3. There discriminant must be negative for imaginary roots to exist
4. 
5. If  , then  by the transitive property. Hence 
6. It must be recognized that  because  . Thus 
7. 
8. Using the parameters for   .

 Hence using the parameters for   and 



1. 
2.  and . Hence 
3. 

 











1. Region b is an area bounded by two ellipses. For an ellipse



Region A is the difference in area of a circle drawn about an ellipse.



So 





1. For unity  ,  , and  . Thus we have  and can write our solution as  . Solving for  , the answers are defined by the set .
2. 
3. The conjugate is 
4. For  there is only 1 sign change and hence 1 positive root. For  there are 2 sign changes and hence there can be 0 or 2 negative roots. Hence there are 2 complex roots.
5. 
6. The roots of  are located at points equidistant on the circumference of a circle with a radius of 1. Thus the perimeter can be represented as 
7. 



1. We know that  and 

Hence  and 



 and 

Thus 

 or for those who are math savvy you’d recognize that the modulus is r