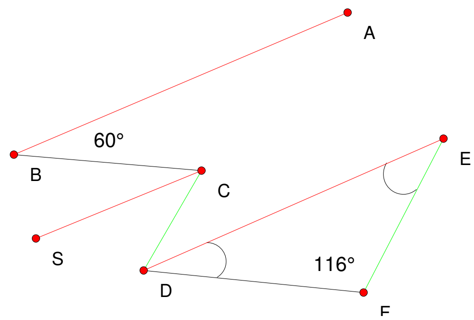
1. $\boxed{\text{A}}$

2. We are given the following: the two red lines are parallel, the two green lines are parallel, $\triangle DFE$ is isosceles so $\angle D = \angle E$. Since $\angle F = 116$, $\angle D + \angle E = 180 - 116 = 64$, so $\angle D = \angle E = 32$. Draw a line CS parallel to AB and DE.

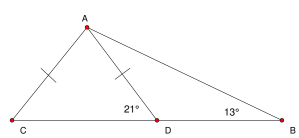


By the Z rule, $\angle CDE = \angle DEF = 32$. By the Z rule again, $\angle CDE = \angle SCD = 32$. Also by the Z rule, $\angle SCB = \angle ABC = 60$. So $\angle BCD = \angle BCS + \angle SCD = 60 + 32 = 92$.

So finally, $\angle BCD + \angle DEF = 92 + 32 = \boxed{124°}$

3. $\boxed{77°}$

4. The only way to draw the triangle so that you have enough information to solve the problem is as follows.



Then we see that $\angle C = 21$, so $\angle BAC = 180 - 13 - 21 = \boxed{146°}$

5. $\boxed{60°}$

6. $\boxed{124°}$

7. $\boxed{\text{D}}$

8. Draw height h in triangle ABC. Now consider the tops of the triangles. Draw an altitude from point A' to AC and connect A and A'. Since they are equilateral triangles, we have a small 30-60-90 triangle. Name the intersection point of the altitude from A' to AC D. Then $AD = \frac{1}{6}h$. Since $\triangle AA'D$ is 30-60-90, we know that $AA' = 2\frac{1}{6}h = \frac{1}{3}h$. Now we know that the height of $A'B'C'$ is $h - \frac{1}{6}h - \frac{1}{3}h = \frac{1}{2}h$. If $A'B'C'$ has half the height of ABC, then we can scoot $A'B'C'$ up to fit in the top of ABC, and then we will have room for three more $A'B'C'$'s. So the ratio of their areas is $\frac{1}{4}$. $\boxed{\text{C}}$

9. $\boxed{\text{B}}$

10. $\boxed{\text{C}}$