



Math Olympiad and Problem Solving Programs

F130 - Advanced Problem Solving

Problem Set 15.1 - Angles

Name:

Date:

1. $\angle a = \boxed{54}$
 $\angle b = \boxed{36}$
 $\angle c = \boxed{56}$
 $\angle d = \boxed{31}$

2. $\angle e = \boxed{57}$
 $\angle f = \boxed{36}$
 $\angle g = \boxed{306}$

3. $\angle h = \boxed{79}$
 $\angle j = \boxed{13}$
 $\angle k = \boxed{17}$

4. $\boxed{6 : 1}$

5. We are given that the ratio of $\angle a$ to $\angle b$ to $\angle c$ is $1 : 2 : 4$. Let's go piece by piece. The ratio of $\angle a : \angle b$ is $1 : 2$, meaning that $\angle b$ is twice $\angle a$. So we can write $\angle b = 2(\angle a)$. Write $2a$ in for $\angle b$ on the diagram. We also know that the ratio for $\angle a : \angle c$ is $1 : 4$, so $\angle c$ is four times as big as $\angle a$. So since $\angle c = 4(\angle a)$, we can write $4a$ in for $\angle c$ on the diagram. Now we see that $\angle b + \angle c = 2a + 4a = 6a$. Since $\angle b + \angle c = 180^\circ$, then $6a = 180$, and $a = 30^\circ$. Now we can find $\angle d$: $d = 180 - a = 180 - 30 = 150^\circ$. So the difference between $\angle d$ and $\angle ABC$ (which is 90° since $ABCD$ is a rectangle) is $150 - 90 = \boxed{60}$