1. Measure the diameters of the circles below. Compute the gear ratio.

\[
\text{Output} : \text{Input} = 3 \text{ inches} : 1.5 \text{ inches} = 2 : 1
\]

2. If an input gear has 24 teeth on its edges and an output gear has 48 teeth on its edges, what is the gear ratio?

\[
\text{Output} : \text{Input} = 48 \text{ teeth} : 24 \text{ teeth} = 2 : 1
\]

3. If an idler gear with 12 teeth is placed in between them, what is the gear ratio?

Adding the idler gear does not end up changing the gear ratio! We can see this by computing each gear ratio. First, we have 48 teeth : 12 teeth for the output gear to the idler, which reduces to 4. Then we take the idler to the input gear ratio, 12 teeth : 24 teeth, which is 0.5. We multiply 0.5 by the first ratio we calculated (4). The answer is 2, which is the same answer we found to question 2.