The goal is to compute a decimal quotient using integer division. The following outlines to logic to do so:

Let Q_{float} be the desired quotient we want, and let Q_{int} be the integer quotient. We can then write the formula:

$$Q_{\text{float}} = N/D = Q_{\text{int}} + R/D$$

In order to find the value of R/D in terms of decimal value, we can multiply R by 100, and then continue dividing by D. This should give us 2 more digits to place after the decimal point.

$$Q_{\text{float}} = Q_1Q_2.R_1R_2 \text{ where } Q_i = \text{ digit of } Q_{\text{int}} \text{ and } R_i = \text{ digit of remainder}$$

Furthermore, we can round the decimal value by using the remainder R^* of R/D. We'll define a rounding cut ρ such that:

$$R^* \leq \rho \implies \text{round down}$$
$$R^* > \rho \implies \text{round up}$$

In order to determine the value of ρ, let's remember that we round up when $R^* \geq D/2$. If D is even, then it is possible for that expression to hold true. If D is odd however, the expression can not hold true because R^* must be an integer. However, subtracting $D-1$ gives us the largest integer less than D that is divisible by 2. Dividing this new value should thus give us the maximum remainder of D that we can round down with.

$$\rho = \begin{cases} \frac{D-1}{2} & \text{if } D \text{ is odd.} \\ \frac{D}{2} - 1 & \text{if } D \text{ is even.} \end{cases}$$