

Repeating decimals

Sometimes when we divide fractions using long division, the division does not end. The quotient *repeats* some part of its decimal digits.

You can indicate a repeating decimal by placing three dots after the decimal, or by placing a line over those decimal digits that repeat.

For example, $\frac{5}{6}$ written as a decimal is 0.8333... or $0.8\overline{3}$. You can also give the answer as a rounded decimal: $5/6 \approx 0.83$

$$\begin{array}{r} 0.8333 \\ 6 \overline{)5.0000} \\ \underline{48} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 2 \end{array}$$

Check:

$$\begin{array}{r} 41 \\ 0.83 \\ \times 6 \\ \hline 4.98 \end{array}$$

You cannot easily multiply with a repeating decimal. Instead, multiply using the *rounded* decimal, and if the answer you get is close to the original dividend, it checks.

More examples:

$0.\overline{7}$ means the same as 0.777...

$2.8\overline{45}$ means 2.8454545454545...

Note that 8 is not part of the repeating pattern - only 4 and 5 are.

$0.\overline{251}$ means the same as 0.251251251...

$1.7\overline{12}$ means 2.71222222...

This time, 7 and 1 are not part of the repeating pattern - only 2 is.

4. Divide. Give your final answer by placing a line over the repeating part of the decimal.

a. $\frac{2}{9}$

) _____

Check:

b. $\frac{2}{3}$

) _____

Check:

c. $\frac{1}{6}$

) _____

Check: