

# Long division

# with decimals

\* start with a  
fraction like  $\frac{1}{4}$

\*  $\frac{1}{4} = 1 \div 4 = 4 \overline{)1}$

$$\begin{array}{r}
 4 \overline{) 1.25} \\
 \underline{- 8} \phantom{00} \\
 20 \\
 \underline{- 20} \\
 00
 \end{array}$$

Start  
left upper  
page side of

$$\frac{1}{4} = .25$$

① put as many zeros as you want after a decimal

② bring decimal up

③ keep going until you get a remainder of zero or until the number repeats

$$\frac{1}{7} = 1 \div 7 = 7 \overline{)1}$$

$$\begin{array}{r} .142857 \\ 7 \overline{) 1.0000000000} \\ \underline{-7} \phantom{0000000000} \\ 30 \phantom{0000000000} \\ \underline{-28} \phantom{0000000000} \\ 20 \phantom{0000000000} \\ \underline{-14} \phantom{0000000000} \\ 60 \phantom{0000000000} \\ \underline{-56} \phantom{0000000000} \\ 40 \phantom{0000000000} \\ \underline{-35} \phantom{0000000000} \\ 50 \phantom{0000000000} \\ \underline{-49} \phantom{0000000000} \\ 10 \end{array}$$

when you get to a remainder that is the same as a previous remainder, the decimal will repeat forever

\* we put a line  
over the repeating  
decimal to indicate  
that it goes on forever.

Example:  $\frac{1}{3} = .\overline{33} = \overline{.3}$

# Practice

$$\frac{1}{6}$$

Key

$$\begin{array}{r}
 .166 \\
 \hline
 6 \overline{) 1.000} \\
 \underline{- 6} \quad \downarrow \\
 40 \\
 \underline{- 36} \quad \downarrow \\
 40
 \end{array}$$

$$\frac{1}{6} = .\overline{166}$$

$$\begin{array}{r}
 .14246 \\
 \hline
 365 \overline{) 52.000000} \\
 \underline{- 365} \phantom{000000} \\
 1550 \phantom{0000} \\
 \underline{- 1460} \phantom{000} \\
 900 \phantom{00} \\
 \underline{- 730} \phantom{0} \\
 1700 \\
 \underline{- 1460} \\
 2400 \\
 \underline{- 2190} \\
 210
 \end{array}$$

This  
will keep  
on going  
for a long  
time

\* stop at 10 decimals

$$\frac{52}{365} = .1424657534$$

not quite  $\frac{1}{7}$ , but close