

## Investigating Terminating and Recurring Decimals

For each of the following fractions, use your calculator to convert it to a decimal, then decide whether it is terminating or recurring. Now find the denominator as a product of its prime factors. Can you spot any patterns?

Terminating decimals have 2s and/or 5s only in their prime factors.

Fraction	Decimal using Calculator	Terminating or Recurring	Denominator as Product of Prime Factors
$\frac{1}{2}$	0.5	Terminating	2
$\frac{1}{3}$	0. $\dot{3}$	Recurring	3
$\frac{1}{4}$	0.25	Terminating	$2 \times 2$
$\frac{1}{5}$	0.2	Terminating	5
$\frac{1}{6}$	0.1 $\dot{6}$	Recurring	$2 \times 3$
$\frac{1}{7}$	0. $\dot{1}4285\dot{7}$	Recurring	7
$\frac{1}{8}$	0.125	Terminating	$2 \times 2 \times 2$
$\frac{1}{9}$	0. $\dot{1}$	Recurring	$3 \times 3$
$\frac{1}{10}$	0.1	Terminating	$2 \times 5$
$\frac{1}{11}$	0. $\dot{0}\dot{9}$	Recurring	11

Fraction	Decimal using Calculator	Terminating or Recurring	Denominator as Product of Prime Factors
$\frac{1}{12}$	0.08 $\dot{3}$	Recurring	$2 \times 2 \times 3$
$\frac{1}{13}$	0. $\dot{0}7692\dot{3}$	Recurring	13
$\frac{1}{14}$	0.0 $\dot{7}1428\dot{5}$	Recurring	$2 \times 7$
$\frac{1}{15}$	0.0 $\dot{6}$	Recurring	$3 \times 5$
$\frac{1}{16}$	0.0625	Terminating	$2 \times 2 \times 2 \times 2$
$\frac{1}{17}$	0. $\dot{0}58823529411764\dot{7}$	Recurring	17
$\frac{1}{18}$	0.0 $\dot{5}$	Recurring	$2 \times 3 \times 3$
$\frac{1}{19}$	0. $\dot{0}5263157894736842\dot{1}$	Recurring	19
$\frac{1}{20}$	0.05	Terminating	$2 \times 2 \times 5$
$\frac{1}{21}$	0. $\dot{0}4761\dot{9}$	Recurring	$3 \times 7$