Recurring Decimals

Decide whether each of these decimals is recurring or terminating:

(a) $0.\dot{5}$ (b) 0.555

(c) $0.\dot{5}0\dot{5}$ (d) 0.055

(e) 5.0505 (f) $0.050505..$

(a), (c) and (f) are recurring
(b), (d) and (e) are terminating

Write down the first ten digits of each of these recurring decimals:

(a) $0.\dot{7}$ (b) $13.\dot{3}$

(c) $0.\dot{7}\dot{3}$ (d) $3.\dot{3}\dot{7}$

(e) $0.\dot{3}0\dot{7}$ (f) $7.\dot{0}3\dot{7}$

(g) $7.\dot{3}3\dot{7}$ (h) $0.\dot{3}10\dot{7}$

(a) 0.777777777
(b) 13.33333333
(c) 0.737373737
(d) 3.373737373
(e) 0.307307307
(f) 7.037037037
(g) 7.337337337
(h) 0.310731073

Write down the first ten digits of each of these recurring decimals:

(a) $0.0\dot{4}$ (b) $4.0\dot{4}\dot{5}$

(c) $5.4\dot{5}$ (d) $0.00\dot{5}\dot{4}$

(e) $0.0\dot{4}0\dot{5}$ (f) $45.4\dot{5}0\dot{4}$

(a) 0.044444444
(b) 4.045454545
(c) 5.455555555
(d) 0.005454545
(e) 0.040540540
(f) 45.45045045

(a) Given that $x = 0.\dot{6}\dot{2}$, write down the first ten digits of:

(i) x (ii) $100x$

(b) Given that $x = 0.\dot{2}4\dot{6}$, write down the first ten digits of:

(i) x (ii) $1000x$

In both cases, what do you notice?

ai) 0.626262626..
ii) 62.626262 62..
bi) 0.246246246..
ii) 246.2462462..
The digits after the decimal point are the same.

(a) Given that $x = 0.1\dot{5}$, write down the first ten digits of:

(i) x (ii) $10x$ (iii) $100x$

(b) Given that $x = 0.0\dot{5}\dot{1}$, write down the first ten digits of:

(i) x (ii) $10x$ (iii) $1000x$

In both cases, what do you notice?

ai) 0.155555555
ii) 1.555555555
iii) 15.55555555
bi) 0.051515151
ii) 0.515151515
iii) 51.51515151
In (ii) and (iii) the digits after the decimal point are the same.