Converting recurring decimals to fractions

1) Change each of the following decimals to a fraction in lowest terms:

(a) 0.36 (b) 0.363636... (c) 0.5363636... (d) 0.3666... (e) 0.555...
(f) 0.012 (g) 0.012012... (h) 0.0121212... (i) 0.01222... (j) 0.055...

Solutions

1) (a) $\frac{36}{100}=\frac{9}{25}$

(b) $x = 0.36363636...$
$100x = 36.363636...$

Subtract: $99x = 36$
$x=\frac{36}{99}=\frac{4}{11}$

(c) $x = 0.536363636...$
$100x = 53.6363636...$

Subtract: $99x = 53.1$
$x=\frac{53.1}{99}=\frac{531}{990}=\frac{59}{110}$

(d) $x = 0.366666...$
$10x = 3.6666666...$

Subtract: $9x = 3.3$
$x=\frac{3.3}{9}=\frac{33}{90}=\frac{11}{30}$

(e) $x = 0.55555555...$
$10x = 5.55555555...$

Subtract: $9x = 5$
$x=\frac{5}{9}$

(f) $\frac{12}{1000}=\frac{3}{250}$

(g) $x = 0.012012012012...$
$1000x = 12.012012012...$

Subtract: $999x = 12$
$x=\frac{12}{999}=\frac{4}{333}$

(h) $x = 0.012121212...$
$100x = 1.212121212...$

Subtract: $99x = 1.2$
$x=\frac{1.2}{99}=\frac{12}{990}=\frac{2}{165}$

(i) $x = 0.012222222...$
$10x = 0.12222222...$

Subtract: $9x = 0.11$
$x=\frac{0.11}{9}=\frac{11}{900}$

(j) $x = 0.0555555...$
$10x = 0.5555555...$

Subtract: $9x = 0.5$
$x=\frac{0.5}{9}=\frac{5}{90}=\frac{1}{18}$