Exercise **15(a)**

1. Convert the following rational numbers into simple continued fractions:
   (a) $\frac{2}{3}$ (b) $\frac{7}{5}$ (c) $\frac{33}{7}$ (d) $\frac{355}{113}$ (e) $\frac{181}{57}$ (f) $-\frac{181}{57}$

2. Find the rational numbers represented by the following simple continued fractions:
   (a) $\left[1;\ 2,\ 7,\ 3\right]$ (b) $[1;\ 2,\ 5,\ 1,\ 1,\ 2]$ (c) $[9;\ 2,\ 1,\ 1,\ 1,\ 2,\ 3]$
   (d) $[1;\ 1,\ 1,\ 1,\ 1,\ 1,\ 1,\ 2]$

3. Convert the following rational numbers into simple continued fractions by using the Euclidean Algorithm:
   (a) $\frac{743}{450}$ (b) $\frac{743}{459}$ (c) $\frac{89}{301}$ (d) $\frac{103993}{33102}$

Brief Solutions

1. (a) $\left[0;\ 1,\ 2\right]$ (b) $\left[1;\ 2,\ 2\right]$ (c) $\left[4;\ 1,\ 2,\ 2\right]$ (d) $[3;\ 7,\ 16]$
   (e) $\left[3;\ 5,\ 1,\ 2,\ 3\right]$ (f) $\left[-4;\ 1,\ 4,\ 1,\ 2,\ 3\right]$
2. (a) $\frac{69}{47}$ (b) $\frac{89}{61}$ (c) $\frac{666}{71}$ (d) $\frac{55}{34}$
3. (a) $[1;\ 1,\ 1,\ 1,\ 6,\ 2,\ 10]$ (b) $[1;\ 1,\ 1,\ 1,\ 1,\ 1,\ 1,\ 1,\ 6,\ 1,\ 2]$
   (c) $\left[0;\ 3,\ 2,\ 1,\ 1,\ 1,\ 1,\ 1,\ 1,\ 2\right]$ (d) $\left[3;\ 7,\ 15,\ 1,\ 292\right]$