

Do not use your calculator for this exercise.

1 Simplify:

a $\frac{1}{\sqrt{5}}$

b $\frac{1}{\sqrt{11}}$

c $\frac{1}{\sqrt{2}}$

d $\frac{\sqrt{3}}{\sqrt{15}}$

e $\frac{\sqrt{12}}{\sqrt{48}}$

f $\frac{\sqrt{5}}{\sqrt{80}}$

g $\frac{\sqrt{12}}{\sqrt{156}}$

h $\frac{\sqrt{7}}{\sqrt{63}}$

2 Rationalise the denominators and simplify:

a $\frac{1}{1 + \sqrt{3}}$

b $\frac{1}{2 + \sqrt{5}}$

c $\frac{1}{3 - \sqrt{7}}$

d $\frac{4}{3 - \sqrt{5}}$

e $\frac{1}{\sqrt{5} - \sqrt{3}}$

f $\frac{3 - \sqrt{2}}{4 - \sqrt{5}}$

g $\frac{5}{2 + \sqrt{5}}$

h $\frac{5\sqrt{2}}{\sqrt{8} - \sqrt{7}}$

i $\frac{11}{3 + \sqrt{11}}$

j $\frac{\sqrt{3} - \sqrt{7}}{\sqrt{3} + \sqrt{7}}$

k $\frac{\sqrt{17} - \sqrt{11}}{\sqrt{17} + \sqrt{11}}$

l $\frac{\sqrt{41} + \sqrt{29}}{\sqrt{41} - \sqrt{29}}$

m $\frac{\sqrt{2} - \sqrt{3}}{\sqrt{3} - \sqrt{2}}$

3 Rationalise the denominators and simplify:

a $\frac{1}{(3 - \sqrt{2})^2}$

b $\frac{1}{(2 + \sqrt{5})^2}$

c $\frac{4}{(3 - \sqrt{2})^2}$

d $\frac{3}{(5 + \sqrt{2})^2}$

e $\frac{1}{(5 + \sqrt{2})(3 - \sqrt{2})}$

f $\frac{2}{(5 - \sqrt{3})(2 + \sqrt{3})}$

E/P 4 Simplify $\frac{3 - 2\sqrt{5}}{\sqrt{5} - 1}$ giving your answer in the

form $p + q\sqrt{5}$, where p and q are rational numbers.

(4 marks)