

Surds

1) Simplify the following:

a) $\sqrt{7} \times \sqrt{7}$

b) $\sqrt{3} \times \sqrt{3}$

c) $\sqrt{20}$

d) $\sqrt{24}$

e) $\sqrt{72}$

f) $\sqrt{200}$

g) $\sqrt{\frac{2}{25}}$

2) Simplify the following:

a) $\sqrt{2} \times \sqrt{18}$

b) $\sqrt{8} \times \sqrt{32}$

c) $\sqrt{99} \times \sqrt{22}$

d) $\sqrt{45} \times \sqrt{20}$

e) $\sqrt{18} \times \sqrt{128}$

f) $\sqrt{28} \times \sqrt{175}$

3) Expand and simplify where possible:

a) $\sqrt{3}(3 - \sqrt{3})$

b) $\sqrt{2}(6 + 2\sqrt{2})$

c) $\sqrt{7}(2 + 3\sqrt{7})$

d) $\sqrt{2}(\sqrt{32} - \sqrt{8})$

4) Expand and simplify where possible:

a) $(1 + \sqrt{2})(1 - \sqrt{2})$

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

c) $(\sqrt{3} + 2)(\sqrt{3} + 4)$

d) $(\sqrt{5} - 3)(\sqrt{5} + 1)$

e) $(2 + \sqrt{7})(2 - \sqrt{7})$

f) $(\sqrt{6} - 3)^2$

5) Work out the following, giving your answer in its simplest form:

a) $\frac{(5 + \sqrt{3})(5 - \sqrt{3})}{\sqrt{22}}$

b) $\frac{(4 - \sqrt{5})(4 + \sqrt{5})}{\sqrt{11}}$

c) $\frac{(3 - \sqrt{2})(3 + \sqrt{2})}{\sqrt{14}}$

d) $\frac{(\sqrt{3} + 1)^2}{\sqrt{3}}$

e) $\frac{(\sqrt{5} + 3)^2}{\sqrt{20}}$

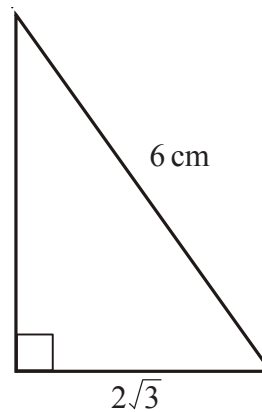
f) $\frac{(5 - \sqrt{5})(2 + 2\sqrt{5})}{\sqrt{20}}$

- 1) $\sqrt{5} = 5^k$
- a) Write down the value of k .
- b) Expand and simplify $(2 + \sqrt{5})(1 + \sqrt{5})$
Give your answer in the form $a + b\sqrt{c}$
where a , b and c are integers.

- 2) The diagram shows a right-angled triangle with lengths of sides as indicated.

The area of the triangle is $A \text{ cm}^2$

Show that $A = k\sqrt{2}$ giving the value of k .



- 3) Given that

$$\frac{8 - \sqrt{18}}{\sqrt{2}} = a + b\sqrt{2}, \text{ where } a \text{ and } b \text{ are integers,}$$

find the value of a and the value of b .

- 4) Work out $(2 + \sqrt{3})(2 - \sqrt{3})$

Give your answer in its simplest form.

- 1) Rationalise the denominator, simplifying where possible:

a) $\frac{3}{\sqrt{2}}$

b) $\frac{2}{\sqrt{2}}$

c) $\frac{3\sqrt{2}}{\sqrt{7}}$

d) $\frac{\sqrt{5}}{\sqrt{10}}$

e) $\frac{1}{4\sqrt{8}}$

f) $\frac{\sqrt{15}}{\sqrt{3}}$

g) $\frac{1}{\sqrt{27}}$

- 2) Rationalise the denominator of $\frac{1}{\sqrt{3}}$

- 3) Rationalise the denominator of $\frac{1}{8\sqrt{8}}$ giving the

answer in the form $\frac{\sqrt{2}}{p}$