

1. Express the following in the form $a\sqrt{2}$, where a is an integer:

a). $\sqrt{200}$

b). $\frac{12}{\sqrt{2}}$

c). $5\sqrt{8} - 3\sqrt{2}$

2. Simplify:

a). $\frac{5}{2 - \sqrt{3}}$

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

3. Expand and simplify:

$$(\sqrt{3} + \sqrt{15})^2$$

4. Simplify:

(i) $(3x^2y)^3$ (ii) $(\sqrt[3]{x})^6$

5. Solve $x^2 + 6x = 4$

Give your answers in the form $p \pm \sqrt{q}$, where p and q are integers.

6. For all values of x ,

$$x^2 - 6x + 15 = (x - p)^2 + q$$

Find the value of p and the value of q .

7. Solve

$$\frac{x}{2x - 3} + \frac{4}{x + 1} = 1$$

8. Solve

$$2x^2 + y^2 = 5$$

$$2x + y = 3$$

giving your answer in surd form.