

1. Evaluate.

(a) $\sqrt{3} \times \sqrt{12} = \sqrt{36}$
 $= 6$

Answer 6

(2)

(b) $\sqrt{3} \div \sqrt{12} = \frac{\sqrt{3}}{\sqrt{12}} = \frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2}$

Answer 1/2

(2)

(c) $(\sqrt{3})^6 = \sqrt{3} \times \sqrt{3} \times \sqrt{3} \times \sqrt{3} \times \sqrt{3} \times \sqrt{3}$
 $= 3 \times 3 \times 3$

or $(\sqrt{3})^6 = (3^{1/2})^6 = 3^3 = 27$

Answer 27

(2)

(Total 6 Marks)

2. Show that $(\sqrt{32} + \sqrt{2})^2 = 50$

$(\sqrt{32} + \sqrt{2})^2 = (4\sqrt{2} + \sqrt{2})^2$
 $= (5\sqrt{2})^2$
 $= 25 \times 2$
 $= 50$

(2)

(Total 2 marks)

3. (a) Express $\sqrt{5} + \sqrt{20}$ in the form $p\sqrt{5}$

$\sqrt{5} + \sqrt{20} = \sqrt{5} + 2\sqrt{5} = 3\sqrt{5}$

Answer 3√5

(2)

(b) Hence, or otherwise, simplify fully $\frac{\sqrt{5} + \sqrt{20}}{\sqrt{45} - \sqrt{20}}$

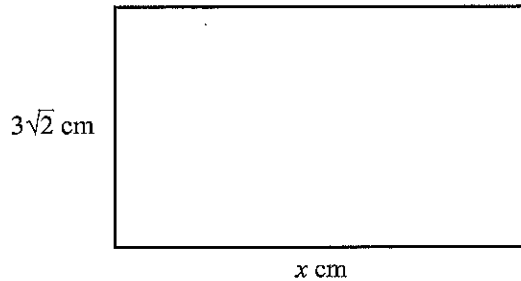
$\frac{\sqrt{5} + \sqrt{20}}{\sqrt{45} - \sqrt{20}} = \frac{3\sqrt{5}}{3\sqrt{5} - 2\sqrt{5}} = \frac{3\sqrt{5}}{\sqrt{5}} = 3$

Answer 3

(3)

(Total 5 marks)

4. The area of this rectangle is 30 cm^2 .



Find the value of x , writing your answer in the form $a\sqrt{b}$ where a and b are integers.

$$3\sqrt{2} x = 30$$

$$x = \frac{30}{3\sqrt{2}} = \frac{10}{\sqrt{2}} = 5\sqrt{2}$$

Answer $5\sqrt{2}$ cm (Total 3 marks)

5. (a) Write $\sqrt{600} + \sqrt{54}$ in the form $p\sqrt{6}$ where p is an integer.

$$\sqrt{600} + \sqrt{54} = 10\sqrt{6} + 3\sqrt{6}$$

$$= 13\sqrt{6}$$

Answer $13\sqrt{6}$

(2)

- (b) Hence write $\frac{\sqrt{600} + \sqrt{54}}{\sqrt{338}}$ in the form \sqrt{q} .

You may use $338 = 2 \times 13^2$

$$\frac{\sqrt{600} + \sqrt{54}}{\sqrt{338}} = \frac{13\sqrt{6}}{\sqrt{338}} = \frac{13\sqrt{6}}{13\sqrt{2}} = \sqrt{3}$$

Answer $\sqrt{3}$

(2) (Total 4 marks)

6. (a) Simplify fully $\sqrt{2}(\sqrt{8}-\sqrt{2})$

$$\sqrt{2}(\sqrt{8}-\sqrt{2}) = \sqrt{2}(2\sqrt{2}-\sqrt{2})$$

$$= \sqrt{2} \times \sqrt{2}$$

$$= 2$$

Answer 2

(2)

(b) Given that $x=\sqrt{2}$ $y=\sqrt{5}$ $z=\sqrt{10}$

work out the value of $\frac{y}{xz}$

Write your answer in its simplest form.

$$\frac{y}{xz} = \frac{\sqrt{5}}{\sqrt{2}\sqrt{10}} = \frac{\sqrt{5}}{\sqrt{20}} = \frac{\sqrt{5}}{2\sqrt{5}} = \frac{1}{2}$$

Answer $\frac{1}{2}$

(2)
(Total 4 marks)

7. (a) Find the value of m when $\sqrt{75}-\frac{9}{\sqrt{3}}=m\sqrt{3}$

$$5\sqrt{3}-3\sqrt{3}=m\sqrt{3}$$

$$2\sqrt{3}=m\sqrt{3}$$

Answer $m =$ 2

(3)

(b) Given that $r=\sqrt{6}$, $s=\sqrt{8}$ and $t=\sqrt{12}$

(i) Simplify fully, $\frac{t}{rs}$

$$\frac{t}{rs} = \frac{\sqrt{12}}{\sqrt{6} \times \sqrt{8}} = \frac{\sqrt{12}}{\sqrt{48}} = \frac{2\sqrt{3}}{4\sqrt{3}} = \frac{1}{2}$$

Answer $\frac{1}{2}$

(Total 2 marks)