GCSE HIGHER · REVISION MAT 5

Surds and exact calculations

1 Work out

$$\frac{3}{5} \div \frac{9}{10}$$

2 Simplify

$$3\sqrt{20}$$

3 Explain why $\sqrt{16}$ is rational but $\sqrt{15}$ is not.

4 A circle has circumference 20π cm.

Find its exact area.

5 Show that

$$(4 - \sqrt{3})(4 + \sqrt{3}) = 13$$

6 A rectangle has area $12\sqrt{2}$ cm^2.

One side is $\sqrt{6}$ cm.

Find the other side as a simplified surd.

7 Show that

$$\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{8}} = \frac{3\sqrt{2}}{4}$$

8 Solve, giving x as a simplified surd.

$$\sqrt{2}x + 3 = \sqrt{8}x - 1$$

Mr&Mrs MATHS

ANSWERS · REVISION MAT 5

Surds and exact calculations

1 $\frac{3}{5} \times \frac{10}{9} = \frac{30}{45}$

$\frac{2}{3}$

2 $3 \times 2\sqrt{5}$

$6\sqrt{5}$

3 $\sqrt{16} = 4 = \frac{4}{1}$

15 is not a square number, so $\sqrt{15}$ cannot be written as a fraction.

4 $2\pi r = 20\pi \Rightarrow r = 10$

100π cm^2

5 $16 - 3$

$= 13$

6 $\frac{12\sqrt{2}}{\sqrt{6}} = \frac{12}{\sqrt{3}}$

$4\sqrt{3}$ cm

7 $\frac{\sqrt{2}}{2} + \frac{\sqrt{8}}{8} = \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{4}$

$= \frac{3\sqrt{2}}{4}$

8 $4 = (2\sqrt{2} - \sqrt{2})x = \sqrt{2}x$

$x = \frac{4}{\sqrt{2}}$

$x = 2\sqrt{2}$

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