AQA, OCR, Edexcel

GCSE

GCSE Maths

Surds Questions

Name:

M M E

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Total Marks: /35

Surds (non-calculator)

1. What Is a Surd?

(1 mark)

2. Simplify the following quantities:
   i. $(\sqrt{5})2$
   ii. $\sqrt{7} \times \sqrt{7}$
   iii. $\sqrt{11}^2$
   iv. $\sqrt{8} \times \sqrt{2}$
   v. $\sqrt{18} \times \sqrt{2}$

(5 Marks)

3. Show that $\sqrt{45} = 3\sqrt{5}$.

(2 marks)

4. Show that $\sqrt{32} = 4\sqrt{2}$

(2 Marks)

5. Given that $2\sqrt{x} = 16$, find x.

(2 marks)

6. Given that $x(\sqrt{32} \times \sqrt{32}) = 64$, find x.

(3 Marks)

7. Simplify the following expressions:

   a) $3\sqrt{2} \times 3\sqrt{2}$
   b) $\sqrt{45} + \sqrt{45}$
   c) $2\left(2\sqrt{2} \times 2\sqrt{2}\right)$
   d) $4\sqrt{3} - 3\sqrt{3}$

(4 Marks)

8. Evaluate the following:

   a) 3^{-2}
   b) 4^{0}
   c) $4^{\frac{1}{2}}$
   d) $\sqrt{144}$

(4 Marks)

9. Expand and simplify the following:

   a) $(3 + 5\sqrt{6})(4 + 4\sqrt{8})$
   b) $(4 + 5\sqrt{12})(7 + 4\sqrt{6})$
   c) $(2 + 3\sqrt{4})(6 + 5\sqrt{3})$

(5 marks)

10. Rationalise the denominator and simplify (Hard):

    a) $\dfrac{3}{\sqrt{6}+3}$
    b) $\dfrac{10}{\sqrt{7}-6}$
    c) $\dfrac{12}{\sqrt{20}-7}$

(5 Marks)

11. Rationalise the denominator and simplify (very hard):

a) $\frac{3+\sqrt{2}}{\sqrt{6}+3}$

(2 Marks)