The Real Number System: Rational & Irrational Numbers

MEMORANDUM

Name: ..... Class: .....

Date: .....

MARK ____ / 14

Answer all questions. Show all your working — marks are awarded for method as well as the final answer. **Teacher copy: accept any correct equivalent method.**

1 List the natural numbers less than 5. (1)

1, 2, 3, 4 ✓ (1)

2 What is the only whole number that is not a natural number? (1)

0 ✓ (1)

3 Is -7 an integer? Is it a natural number? (2)

Yes, it is an integer; **no**, it is not natural. ✓✓ (2)

4 Define a rational number. (2)

One that can be written as $\frac{a}{b}$ with a, b integers and $b \neq 0$. ✓✓ (2)

5 Is $\sqrt{36}$ rational or irrational? Why? (2)

Rational — $\sqrt{36} = 6$, an exact whole number. ✓✓ (2)

6 Is $\sqrt{20}$ rational or irrational? Why? (2)

Irrational — 20 is not a perfect square, so the decimal never ends or repeats. ✓✓ (2)

7 Is $0{,}45$ rational? (1)

Yes — it terminates, and equals $\frac{45}{100}$. ✓ (1)

8 Is $0{,}666\ldots$ rational? (1)

Yes — it recurs, and equals $\frac{2}{3}$. ✓ (1)

9 Name two irrational numbers. **(2)**

> π and $\sqrt{2}$ (or the square root of any positive whole number that is not a perfect square) ✓✓ (2)

TOTAL: 14 marks

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