

## Unit 3: Squares, Square roots, Cubes and Cube Roots

**1. M/J 17/P12/Q20/a,b(i)**

- (a) (i) Write 54 as the product of its prime factors. [1]
- (ii) Find the smallest possible integer  $m$  such that  $54m$  is a cube number. [1]
- (b) Find the value of  $k$  in each of the following.
- (i)  $\sqrt{27} = 3^k$  [1]

**2. O/N 17/P11/Q14**

The table shows the square roots, given correct to 4 significant figures, of some numbers from 31.0 to 32.9.

	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
31	5.568	5.577	5.586	5.595	5.604	5.612	5.621	5.630	5.639	5.648
32	5.657	5.666	5.675	5.683	5.692	5.701	5.710	5.718	5.727	5.736

For example, the square root of 32.5 is 5.701.

Use the table to find

- (a) the difference between the square root of 32.5 and the square root of 31.3, [1]
- (b) an estimate of the square root of 32.25, [1]
- (c) the number which has a square root of 56.39. [1]

**3. M/J 17/P11/Q10/b**

- (a) Estimate, correct to the nearest whole number, the value of  $\sqrt[3]{8.36} + \sqrt[3]{63.58}$ . [1]

**4. O/N 14/P11/Q4/a**

$x$  is an integer between 50 and 70.

Write down the value of  $x$  when

- (a)  $x$  is a cube number, [1]

**5. M/J 13/P12/Q3/b**

- (a) Convert  $41.6 \text{ cm}^2$  to  $\text{mm}^2$ . [1]

**6. M/J 13/P12/Q8/a**

- (a) James thinks of a **two-digit** number.  
It is a cube number.  
It is an even number.  
What is his number? [1]

**7. M/J 13/P11/Q12/c**

6

9

1

The three cards above can be rearranged to make three-digit numbers, for example 916.

Arrange the three cards to make

- (a) a three-digit number that is a square number. [1]



**8. O/N 12/P11/Q7/b**

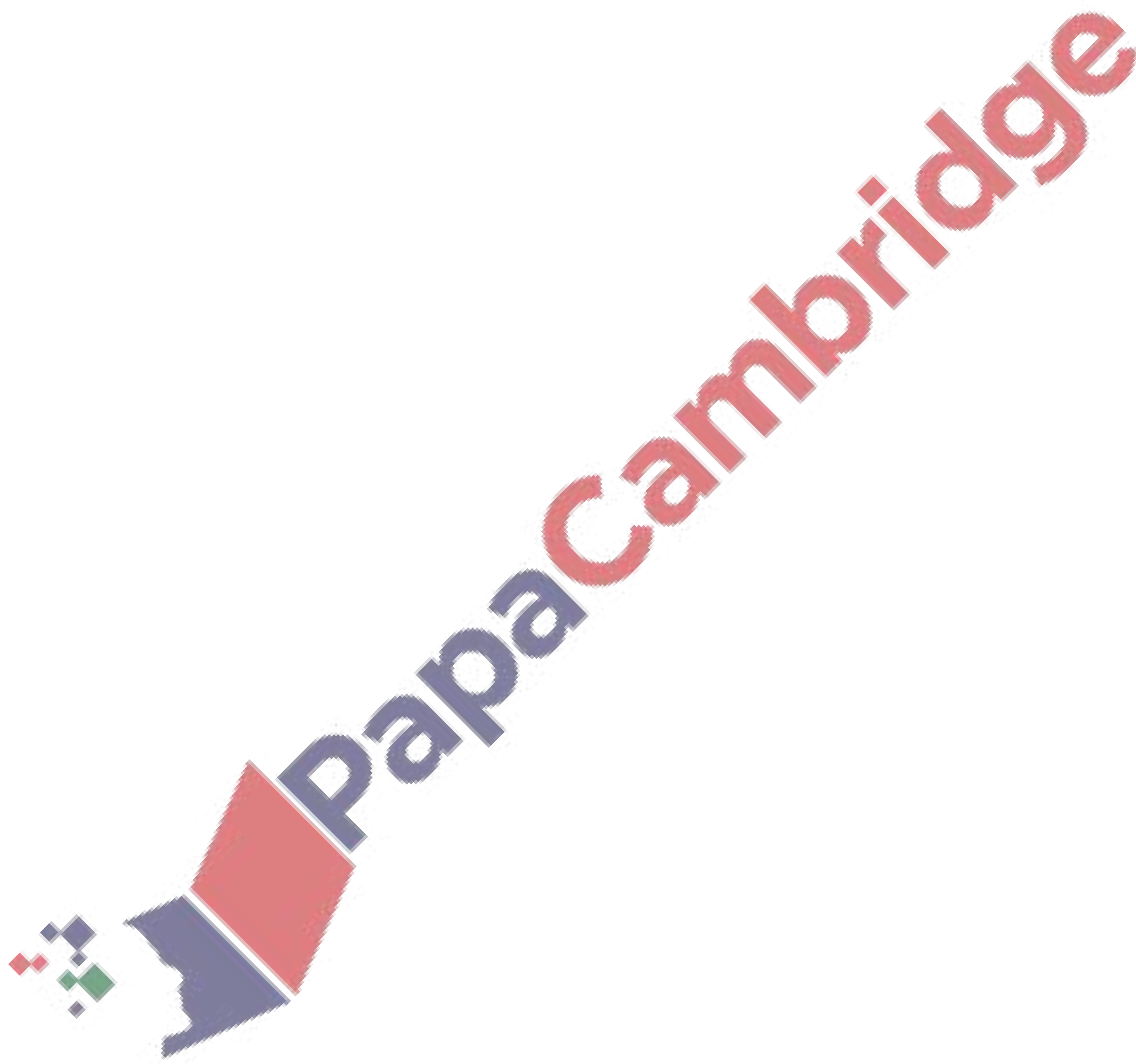
(a) The values of three cube roots, correct to 1 decimal place, are given below.

$$\sqrt[3]{5} = 1.7 \quad \sqrt[3]{50} = 3.7 \quad \sqrt[3]{500} = 7.9$$

Using as much of the above information as is necessary, find the value of  $\sqrt[3]{0.005}$ . [1]

**9. M/J 09/P1/Q3/a**

(a) Write down the two cube numbers between 10 and 100. [1]





## Answers Section

- 1. M/J 17/P12/Q20/a,b(i)**
- (a) (i)  $2 \times 3^3$  or  $2 \times 3 \times 3 \times 3$       1  
 (ii) 4      1
- (b) (i)  $\frac{3}{2}$  oe      1
- 2. O/N 17/P11/Q14**
- (a) 0.106      1  
 (b) 5.678 to 5.68[0]      1  
 (c) 3180      1
- 3. M/J 17/P11/Q10/b**
- (a) 6      1
- 4. O/N 14/P11/Q4/a**
- (a) 64      1
- 5. M/J 13/P12/Q3/b**
- (a) 4160      1
- 6. M/J 13/P12/Q8/a**
- (a) 64      1
- 7. M/J 13/P11/Q12/c**
- (a) 169, 196 or 961      1
- 8. O/N 12/P11/Q7/b**
- (a) 0.17      1
- 9. M/J 09/P1/Q3/a**
- (a) 27, 64      1

