

# Delta 3

## Unit 1 Review (Non-Calculator)

### Powers and Roots

**How well did you do:**

Powers and Roots	Score = $\frac{\quad}{48}$	
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<b>Topics/skills which need to be revisited:</b>	<b>Questions from Review</b>	<b>Further Practice from Delta 3</b>
<ul style="list-style-type: none"> <li>• Finding reciprocals</li> </ul>	<ul style="list-style-type: none"> <li>• 2</li> </ul>	<ul style="list-style-type: none"> <li>• P18 Q1-3</li> </ul>
<ul style="list-style-type: none"> <li>• Work our powers of fractions</li> <li>• Use indices rules to simplify</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 6</li> </ul>	<ul style="list-style-type: none"> <li>• P18 Q4</li> <li>• P18 Q5,6</li> </ul>
<ul style="list-style-type: none"> <li>• Writing normal numbers in standard form</li> <li>• Order numbers written in standard form</li> </ul>	<ul style="list-style-type: none"> <li>• 3</li> <li>• 4</li> </ul>	<ul style="list-style-type: none"> <li>• P17 Q3,4</li> <li>• P17 Q5</li> </ul>
<ul style="list-style-type: none"> <li>• Multiplying numbers in standard form without a calculator</li> <li>• Dividing numbers in standard form without a calculator</li> </ul>	<ul style="list-style-type: none"> <li>• 5b</li> <li>• 5a</li> </ul>	<ul style="list-style-type: none"> <li>• P17 Q6,7</li> <li>• P17 Q6,7</li> </ul>
<ul style="list-style-type: none"> <li>• Simplifying numbers involving fractional powers</li> <li>• Simplifying numbers involving negative fractional powers</li> </ul>	<ul style="list-style-type: none"> <li>• 9</li> <li>• 10</li> </ul>	<ul style="list-style-type: none"> <li>• P19 Q10</li> <li>• P19 Q11</li> </ul>
<ul style="list-style-type: none"> <li>• Simplifying surds</li> <li>• Multiplying surds</li> <li>• Adding/subtracting surds</li> <li>• Understanding what rational and irrational numbers are (especially surds)</li> <li>• Solve multi-stage problems involving surds and prior knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• 7a,b</li> <li>• 7c</li> <li>• 8</li> <li>• 11,12</li> <li>• 13</li> </ul>	<ul style="list-style-type: none"> <li>• P19 Q1</li> <li>• P19 Q2a-c</li> <li>• P23 Q22</li> <li>• P19 Q4, P20 Q6</li> <li>• P19 Q3</li> </ul>

1. Write as a fraction

(a)  $\left(\frac{1}{5}\right)^2$  .....

(b)  $\left(\frac{3}{4}\right)^3$  .....  
(2 marks)

2. Write down the reciprocal of

(a) 8 .....

(b)  $\frac{4}{7}$  .....

(c)  $2\frac{3}{5}$  .....

(d)  $\frac{1}{3}$  .....  
(5 marks)

3. Write each number in standard form:

(a) 760 .....

(b) 0.00000428 .....  
(2 marks)

4. Put these five numbers in order, from smallest to largest.

$3.14 \times 10^{-2}$      $3.11 \times 10^{-4}$      $3.1 \times 10^2$      $3.13 \times 10^3$      $3.14 \times 10$

(1 mark)

5. Work out each calculation. Give your answers in standard form.

(a)  $\frac{6.6 \times 10^8}{3.3 \times 10^3}$

.....

(b)  $(3.5 \times 10^4) \times (7 \times 10^{-7})$

.....

(5 marks)

6. Write as single power.

(a)  $5^3 \times 5^{-4}$

.....

(b)  $6^{-4} \div 6^{-2}$

.....

(c)  $(8^{-2})^3$

.....

(d)  $\frac{3^{-4} \div 3^{-1}}{3^{-1} \times 3^{-1}}$

.....

(5 marks)

7. Simplify fully

(a)  $\sqrt{80}$

.....

(b)  $\sqrt{50}$

.....

(c)  $\sqrt{2} \times \sqrt{40}$

.....

(6 marks)

8. Simplify, leaving your answers in surd form.

(a)  $5\sqrt{7} + 3\sqrt{7}$  .....

(b)  $7\sqrt{5} + 2\sqrt{5} - 3\sqrt{5}$  .....  
(2 marks)

9. Work out

(a)  $64^{2/3}$  .....

(b)  $\left(\frac{1}{16}\right)^{3/2}$  .....  
(4 marks)

10. Work out

(a)  $121^{-1/2}$  .....

(b)  $\left(\frac{27}{8}\right)^{-2/3}$  .....  
(6 marks)

11. Say whether each number is rational or irrational.

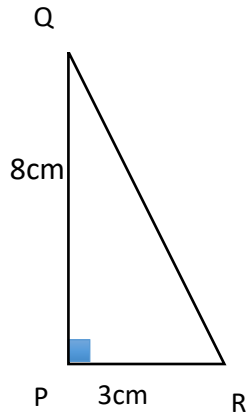
(a)  $\sqrt{5}$  .....

(b)  $\frac{1}{3}$  .....

(c)  $\sqrt{16}$  .....

(d)  $\frac{3}{\pi}$  .....  
(4 marks)

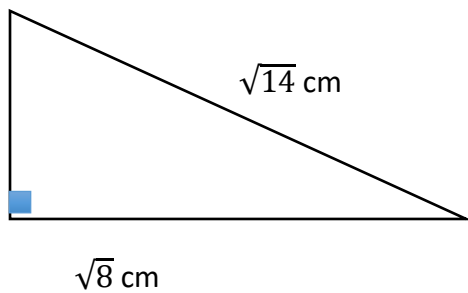
12. PQR is a right-angled triangle. What is the most accurate answer for the length of QR?



- A: 8.544003745 cm  
B: 8.5 cm (to 2 s.f.)  
C:  $\sqrt{73}$  cm  
D: 8.54 cm (to 2 d.p.)

.....  
(1 mark)

13. Show that the area of the triangle is  $\sqrt{12}$  cm<sup>2</sup>



(5 marks)

[End of Review]