

Surds, indices and logs test

SL/HL

1. Simplify the following surds:

a) $\sqrt{147}$ b) $\frac{\sqrt{175}}{\sqrt{7}}$ c) $(\sqrt{5} - 2\sqrt{10})^2$ [6]

2. Rationalise the denominator in the fraction,

$$\frac{5 - \sqrt{2}}{3 + \sqrt{2}} \quad [4]$$

3. Evaluate the value of x to 3 decimal places in the equation,

$$2^x = 10 \quad [3]$$

4. Find the missing letter in each of the equations below.

a) $\log_x 64 = 6$

b) $\log_3 y = 4$

c) $\log_4 64 = z$ [6]

5. Solve, $\log_5(26x - 10) = 3 + \log_5(x - 8)$. [4]

6. Let $x = \log_a 2$ and $y = \log_a 3$, find in terms of x and y ,

a) $\log_a 36$ b) $\log_a \left(\frac{27}{16}\right)$ [4]

7. Evaluate $\log_y 2 \times \log_{32} y$ [3]

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Answers

1. a) $7\sqrt{3}$ b) 5 c) $45 - 40\sqrt{2} = 5(9 - 8\sqrt{2})$

2. $\frac{17 - 8\sqrt{2}}{7}$

3. 3.322

4. a) $x = 2$ b) $y = 81$ c) $z = 3$

5. $x = 10$

6. a) $2(x + y)$ b) $\frac{3y}{4x}$

7. $\frac{1}{5}$