

班級 _____ 班 座號 _____ 姓名 _____

答案

一、填充題 (10 題 每題 10 分 共 100 分)

1.12 2. $\frac{50}{3}$ 3.4 4. $\frac{46}{3}$ 5.20 6.2 7.3 8.3 9.2 10.4

解析

一、填充題 (10 題 每題 10 分 共 100 分)

2. $a = \log_5 2 \Rightarrow 5^a = 2$

$$b = \log_3 5 \Rightarrow 3^b = 5 \Rightarrow (3^b)^{\frac{1}{b}} = 5^{\frac{1}{b}} \Rightarrow 3 = 5^{\frac{1}{b}}$$

$$\therefore 5^{a - \frac{1}{b} + 2} = 5^a \times 5^{-\frac{1}{b}} \times 5^2 = 2 \times \frac{1}{3} \times 25 = \frac{50}{3}$$

3. 所求 = $\log_6 4 + \log_6 27 + \log_6 12 = \log_6 (4 \times 27 \times 12) = \log_6 6^4 = 4$

4. $5^{\frac{\log_2 6}{\log_2 5}} = 5^{\log_5 6} = 6$

$$4^{\frac{1}{\log_5 4}} = 4^{\frac{\log_5 5}{\log_5 4}} = 4^{\log_4 5} = 5$$

$$2^{-\log_4 9} = 2^{\log_4 \frac{1}{9}} = 2^{\log_{\sqrt{4}} \sqrt{\frac{1}{9}}} = 2^{\log_2 \frac{1}{3}} = \frac{1}{3}$$

$$9^{\log_3 2} = 9^{\log_3 2^2} = 9^{\log_9 4} = 4$$

$$\therefore \text{原式} = 6 + 5 + \frac{1}{3} + 4 = \frac{46}{3}$$

5. 所求 = $(\log_3 5) \times (\log_5 2^5) \times (\log_2 81)$
= $(\log_3 5) \times (5 \log_5 2) \times (\log_2 81)$
= $5 \times (\log_3 5) \times (\log_5 2) \times (\log_2 81)$
= $5 \times \log_3 81 = 5 \times 4 = 20$

6. $\log_4 (x+2)^2 + \log_4 (x-1) = 2$

$$\Rightarrow \log_4 [(x+2)^2(x-1)] = 2 \Rightarrow (x+2)^2(x-1) = 16 \Rightarrow x^3 + 3x^2 - 20 = 0$$

$$\Rightarrow (x-2)(x^2 + 5x + 10) = 0 \quad \therefore x = 2$$

7. $\log_2 [(x+1)(x-2)] = 2$

$$\Rightarrow (x+1)(x-2) = 4 \Rightarrow x^2 - x - 6 = 0 \Rightarrow (x-3)(x+2) = 0$$

$$\therefore x = 3 \text{ 或 } -2 \text{ (不合)}$$

8. $\log_2 (x+1) - \log_2 (x-2) = 2$

$$\Rightarrow \frac{x+1}{x-2} = 4 \text{ 得 } x = 3$$

$$9. \text{原式} \Rightarrow \log_5 \frac{7x+10}{2x-1} = \log_5 8$$

$$\Rightarrow \frac{7x+10}{2x-1} = 8 \Rightarrow x = 2$$

$$10. \text{原式} \Rightarrow \log_{10}[(x+1)(x-2)] = \log_{10} 10$$

$$\Rightarrow (x+1)(x-2) = 10 \Rightarrow x^2 - x - 12 = 0$$

$$\Rightarrow (x-4)(x+3) = 0$$

$$\Rightarrow x = 4 \text{ 或 } -3 \text{ (不合)}, \text{ 故 } x = 4$$