

Task 1. Ans: A

$$\sqrt[3]{\frac{1}{27}} \cdot \left(\frac{1}{729}\right)^2 \cdot \left(\frac{1}{81}\right)^{-4} = 3^{-1} \cdot (3^{-6})^2 \cdot (3^{-4})^{-4} = 3^{-1} \cdot 3^{-12} \cdot 3^{16} = 3^{-1+(-12)+16} = 3^3$$

Task 2.

(a) $\sqrt{a} + b^5$

(b) $|a - \sqrt[3]{b}|$

(c) $\frac{1}{ab}$

Task 3.1

FT

Task 3.2

Ans. BG

Task 4.1 Ans. C

$$f(x) \leq -1 \text{ for } x \in (-4; -2) \cup (2; 4)$$

Task 4.2.

$$D_f = (-4; -2) \cup (-1; 4)$$

$$ZW_f = \{-2\} \cup \langle -1.2 \rangle$$

Task 5.

FF

Task 6. Ans. B

$$2x + 1 = 16 \vee 2x + 1 = -16 \Rightarrow x = 7.5 \vee \underline{x = -8.5}$$

Task 7. Ans D.

$$P_{\Delta} = \frac{1}{2} \cdot 4 \cdot 6 \cdot \sin 30^{\circ} = \frac{1}{2} \cdot 4 \cdot 6 \cdot \frac{1}{2} = 6$$

Task 8. Ans. C

$$P_{\Delta} = 9\sqrt{3}, P_{\circ} = 12\pi, P = 12\pi - 9\sqrt{3} = 3(4\pi - 3\sqrt{3})$$

Task 9. Ans. C

$$\cos \alpha = \frac{\sqrt{3}}{2} \Rightarrow \alpha = 30^{\circ}.$$

$$\sin 30^{\circ} = \frac{6}{3x} \Rightarrow x = 4$$

$$|AB| = 16, |AD| = 12, L = 32 + 24 = 56$$

Task 10. Ans. B

$$g(x) = -2(x - 1) - 3 = -2x - 1$$

Task 11.

1. $(x - 4)^2 + (y - 2)^2 = 100$

2. $B(12, -4)$

Task 12.

1. $V = 100\pi$

2. $P_b = 65\pi$

Task 13. Ans. C

Case 1: Third digit greater than 1 – $30\Box - 4$ options

Case 2: Second digit greater than 0 – $3\Box\Box - 4 \cdot 5 = 20$ options

Case 3: First digit greater than 3 – $\Box\Box\Box - 2 \cdot 5 \cdot 5 = 50$ options

$$4 + 20 + 50 = 74$$

Task 14.

1. 36 elements

2. $|A'| = 8, P(A) = 1 - P(A') = 1 - \frac{8}{36} = \frac{28}{36} = \frac{7}{9}$

Task 15.

1. $D = 3$

2. $M_e = 3$