

Infinity Think Beyond — Class VIII Mathematics

Practice Paper (Mid-Term) — Set 2 — Answer Key

Based on Ganita Prakash – Part I

[illegible]

Q.No	Step-by-Step Solution	Marks per Step
SECTION – A (Q1, subparts i–xii, 1 mark each)		
	(x) $\sqrt[3]{64} = 4, \sqrt[3]{27} = 3$ 4×3 Answer: (d) 12 (xi) $(1000-2)(1000+2) = 1000000 - 4$ Answer: (a) 999996 (xii) $213 = 2(100) + 1(10) + 3(1) \rightarrow$ two 9's, one n, three 's Answer: (a) 99n 	
SECTION-B (Q2–7, 2 marks each)		
2	Q2 $1536 = 2^9 \times 3$ 2^9 is already a multiple of 3 in exponent; 3^1 is not Divide by 3 Answer: 3	2 marks
3	Q3 $2^{-6} \times 2^7 = 2^1$ Answer: 2	2 marks
4	Q4 Side = $\sqrt{(8^2 + 6^2)} = \sqrt{(64+36)} = \sqrt{100}$ Answer: 10 cm	2 marks
5	Q5 (a) Smallest 5-digit number = 10000 $10000 \div 36 = 277.7...$, round up to 278 278×36 Answer: 10008 OR (b) MCMXCIV = $1000+900+90+4$ Answer: 1994	2 marks
6	Q6 $3 \text{ cups} \div 2 \text{ dozen} \times 5 \text{ dozen}$ Answer: 7.5 cups	2 marks
7	Q7	2 marks

Q.No	Step-by-Step Solution	Marks per Step
SECTION – A (Q1, subparts i–xii, 1 mark each)		
	$(2a+3b)^2 = 4a^2+12ab+9b^2 = 4(25)+12(10)+9(4) = 100+120+36$ Answer: 256	
SECTION-C (Q8–10, 3 marks each)		
8	Q8 (i) CXLIV=144, CCXXI=221 $144+221=365$ Answer: CCCLXV (ii) DCCC=800, CXCIX=199 $800+199=999$ Answer: CMXCIX	1.5 marks each
9	Q9 (a) Opposite angles of a parallelogram are equal: $3x+15 = 5x-25$ $40 = 2x \rightarrow x=20$ $\angle A = \angle C = 75^\circ$, $\angle B = \angle D = 180-75=105^\circ$ Answer: $x=20$; angles $75^\circ, 105^\circ, 75^\circ, 105^\circ$ OR (b) Diagonals bisecting each other $\rightarrow$ quadrilateral is a parallelogram Equal diagonals in a parallelogram $\rightarrow$ all angles are 90°, i.e. a rectangle Answer: Proved — the quadrilateral must be a rectangle	3 marks
10	Q10 (i) $3a(5a+b) - 2b(5a+b) = 15a^2+3ab-10ab-2b^2$ Answer: $15a^2 - 7ab - 2b^2$ (ii) $(m+n)^2 - 1^2 = m^2+2mn+n^2 - 1$ Answer: $m^2 + 2mn + n^2 - 1$	1.5 marks each
SECTION-D (Q11–13, 5 marks each)		
11	Q11 (i) $1372 = 2^2 \times 7^3$ Exponent of 2 needs to reach 3; multiply by 2 $1372 \times 2 = 2744 = 14^3$	3+2 marks

Q.No	Step-by-Step Solution	Marks per Step
SECTION – A (Q1, subparts i–xii, 1 mark each)		
	Answer: Multiply by 2; cube root of product = 14 (ii) $15129 = 3^2 \times 41^2$ $\sqrt{15129} = 3 \times 41$ Answer: 123	
12	Q12 Main (i): $4^{2x-x-1+3} = 4^{x+2}$ Answer: 4^{x+2} Main (ii): $125 = 5^3$, so $2x-1 = 3$ Answer: $x = 2$ OR (i): $(\frac{1}{3} + \frac{1}{4})^{-1} = (\frac{7}{12})^{-1}$ Answer: $\frac{12}{7}$ OR (ii): $x = \frac{1}{3} \rightarrow x^{-1} = 3 \rightarrow (x^{-1})^{-2} = 3^{-2}$ Answer: $\frac{1}{9}$	2.5+2.5 marks
13	Q13 (i) Try AB=75: $75 \times 9 = 675$ (last two digits match AB) Answer: A=7, B=5, D=6 (ii) 12ab6 ends in 6 (already even); digit sum $9+a+b$ divisible by 9 Answer: (a,b) = (0,0), (0,9), (1,8), (2,7), (3,6), (4,5), (5,4), (6,3), (7,2), (8,1), (9,0), (9,9) (iii) A number leaving remainder 3 on division by 8 Answer: $8k + 3$	2+2+1 marks
SECTION-E (Q14–16, case-based, 4 marks each)		
14	Q14 (i) Opposite sides equal: $x+3 = 2x-5$ $8 = x$ Answer: $x = 8$	1+1+2 marks

Q.No	Step-by-Step Solution	Marks per Step
SECTION – A (Q1, subparts i–xii, 1 mark each)		
	(ii) $PS = x+3 = 8+3$ Answer: 11 cm (iii)(a): Perimeter = $2(8+11)$ Answer: 38 cm (iii)(b) OR: Diagonals bisect each other: $OP = PR \div 2 = 14 \div 2$ Answer: 7 cm	
15	Q15 (i) $(30+7)^2 = 900+420+49$ Answer: 1369 (ii) $(100-4)(100+4) = 10000-16$ Answer: 9984 (iii)(a): $(p+q)^2 - (p-q)^2 = (p^2+2pq+q^2) - (p^2-2pq+q^2) = 4pq$ Answer: Proved: $(p+q)^2 - (p-q)^2 = 4pq$ (iii)(b) OR: Choose $b=3$: $a^2=(a+b)(a-b)+b^2 = (206)(200)+9 = 41200+9$ Answer: 41209	1+1+2 marks
16	Q16 (i) $1200 \div 8$ Answer: 150 litres/hour (ii) 150×5 Answer: 750 litres (iii)(a): $2700 \div 150$ Answer: 18 hours	1+1+2 marks

Q.No	Step-by-Step Solution	Marks per Step
SECTION – A (Q1, subparts i–xii, 1 mark each)		
	(iii)(b) OR: $8 \times 2100 = 16800$; $1200 \times 14 = 16800$ — equal Answer: Yes, they are in proportion	

Prepared by Deepika Bhati | Infinity Think Beyond | www.infinitythinkbeyond.co.in

