

Infinity Think Beyond — Class VIII Mathematics

Practice Paper (Mid-Term) — Set 5 — 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) $(a+b)^2 = a^2 + 2ab + b^2 \rightarrow 100 = a^2 + b^2 + 2(21)$ $a^2 + b^2 = 100 - 42$ Answer: (c) 58 (xi) $2^{50-48} = 2^2$ Answer: (b) 4 (xii) Units digits of powers of 7 cycle: 7,9,3,1 (period 4) $25 \bmod 4 = 1 \rightarrow$ matches first position Answer: (c) 7	
SECTION-B (Q2–7, 2 marks each)		
2	Q2 $1188 = 2^2 \times 3^3 \times 11$ 3^3 needs one more 3; 11^1 needs one more 11 Multiply by 3×11 Answer: 33	2 marks
3	Q3 $2^{4-2+3} = 2^5$ Answer: 32	2 marks
4	Q4 $x + (x+30) = 180$ (adjacent angles are supplementary) $2x = 150$ Answer: $x = 75$	2 marks
5	Q5 (a) $CC=200, XC=90, IX=9$ $200+90+9$ Answer: 299 OR (b) Let numbers be $4k, 4k+4, 4k+8$ $12k+12=84 \rightarrow k=6$ Answer: 24, 28, 32	2 marks
6	Q6 $630 \div 15 \times 22$	2 marks

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SECTION – A (Q1, subparts i–xii, 1 mark each)		
	Answer: ₹924	
7	Q7 $4x^2 - 25 = 4(100) - 25 = 400 - 25$ Answer: 375	2 marks
SECTION-C (Q8–10, 3 marks each)		
8	Q8 (i) CDXCIX=499, CXI=111 499+111 Answer: DCX (610) (ii) DCCLXX=770, CXXX=130 770+130 Answer: CM (900)	1.5 marks each
9	Q9 (a) Diagonal of a square = side $\times \sqrt{2} = 10\sqrt{2}$ The diagonal of a square bisects each 90° angle Answer: PR = $10\sqrt{2}$ cm $\approx$ 14.14 cm; $\angle QPR = 45^\circ$ OR (b) Draw square PQRS with side 6 cm using a set square/protractor for right angles Join one diagonal, e.g. PR Measure PR = $6\sqrt{2}$ cm Answer: Diagonal $\approx$ 8.49 cm ($6\sqrt{2}$ cm)	3 marks
10	Q10 (i) $(6p)^2 - (5q)^2 = 36p^2 - 25q^2$ Answer: $36p^2 - 25q^2$ (ii) Using $(a+b)^2 - (a-b)^2 = 4ab$ with $a=2x$, $b=3$ $4(2x)(3)$ Answer: $24x$	1.5 marks each
SECTION-D (Q11–13, 5 marks each)		
11	Q11 (i) $2916 = 2^2 \times 3^6$	3+2 marks

Q.No	Step-by-Step Solution	Marks per Step
SECTION – A (Q1, subparts i–xii, 1 mark each)		
	2^2 is not a multiple-of-3 exponent; divide it out $2916 \div 4 = 729 = 9^3$ Answer: Divide by 4; cube root of quotient = 9 (ii) $18496 = 2^6 \times 17^2$ $\sqrt{18496} = 2^3 \times 17 = 8 \times 17$ Answer: 136	
12	Q12 Main (i): $5^{3x-x-2} = 5^{2x-2}$ Answer: 5^{2x-2} Main (ii): $343=7^3$, so $3y=3$ Answer: $y = 1$ OR (i): $8^{-1} \times 8^3 = 8^2$; $8^2 \div 8^{-1} = 8^3$ Answer: 512 OR (ii): $(\frac{1}{2})^{-3} \times (\frac{1}{2})^3 = (\frac{1}{2})^0$ Answer: 1	2.5+2.5 marks
13	Q13 (i) Try PQ=50: $50 \times 7 = 350$ (last two digits match PQ) Answer: P=5, Q=0, R=3 (ii) 6a4b2: last two digits b2 divisible by 4; digit sum $12+a+b$ divisible by 3 Answer: e.g. (a,b) = (0,3), (0,9), (1,5) — 17 valid pairs in total (iii) A number leaving remainder 1 on division by 6 Answer: $6k + 1$	2+2+1 marks
SECTION-E (Q14–16, case-based, 4 marks each)		
14	Q14 (i) AB = AD (given kite property)	1+2+1 marks

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SECTION – A (Q1, subparts i–xii, 1 mark each)		
	Answer: AD = 9 cm (ii)(a): In a kite, angles between unequal sides ($\angle ABC$ and $\angle ADC$) are equal Answer: $\angle ADC = 115^\circ$ (ii)(b) OR: AC is the axis of symmetry of the kite, so it bisects the vertex angles at A and C Answer: Proved — AC bisects $\angle BAD$ and $\angle BCD$ (iii) Angle sum of quadrilateral = 360° $\angle BCD = 360 - 70 - 115 - 115$ Answer: $\angle BCD = 60^\circ$	
15	Q15 (i) $(3x+4)(2x-1) = 6x^2 - 3x + 8x - 4$ Answer: $6x^2 + 5x - 4$ (ii) At $x=5$: $6(25)+5(5)-4 = 150+25-4$ Answer: 171 m^2 (iii)(a): Perimeter = $2[(3x+4)+(2x-1)] = 2(5x+3)$ Answer: $10x + 6$ (iii)(b) OR: At $x=5$: $10(5)+6$ Answer: 56 m	1+1+2 marks
16	Q16 (i) 16×7.5 Answer: 120 km (ii) $200 \div 16$ Answer: 12.5 litres (iii)(a): $360 \div 16$	1+1+2 marks

Q.No	Step-by-Step Solution	Marks per Step
SECTION – A (Q1, subparts i–xii, 1 mark each)		
	Answer: 22.5 litres (iii)(b) OR: $1 \times 80 = 80$; $16 \times 5 = 80$ — equal Answer: Yes, they are in proportion	

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