Infinity Think Beyond — Class VIII Mathematics

Practice Paper (Mid-Term) — Set 4 — Answer Key

Based on Ganita Prakash – Part I

Q.No	Step-by-Step Solution	Marks per Step
	SECTION – A (Q1, subparts i–xii, 1 mark each)	
1	**Q1**	*1 mark each*
	(i)	*1 mark each*
	$5^0=1$; $5^{-1}=\frac{1}{5}$	*1 mark each*
	$1+\frac{1}{5}$	*1 mark each*
	Answer: (a) $\frac{6}{5}$	*1 mark each*
	(ii)	*1 mark each*
	$k=\frac{20}{4}=5$	*1 mark each*
	$y=5\times 9$	*1 mark each*
	Answer: (c) 45	*1 mark each*
	(iii)	*1 mark each*
	Property of isosceles trapezium: base angles at the same base are equal	*1 mark each*
	Answer: (b) equal	*1 mark each*
	(iv)	
	$(-10)^3=-1000$	
	Answer: (b) −10	
	(v)	
	$1+2+3+4+5+6=21 \rightarrow 2+1=3$	
	Answer: (c) 3	
	(vi)	
	$p^2-2pq+q^2+4pq=p^2+2pq+q^2=(p+q)^2$	
	Answer: (a) $(p+q)^2$	
	(vii)	
	XC=90, IV=4	
	90+4	
	Answer: (a) 94	
	(viii)	
	$82,00,00,000=8.2\times 10^8$	
	Answer: (b) 8.2×10^8	
	(ix)	
	$15\times 60=900$; $20\times 45=900$ — equal	
	Answer: (a) Yes, they are proportional	

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	(x) Diagonals of n-sided polygon = $n^{(n-3)/2}$; for n=5: $5^{(2)/2}$ **Answer: (c) 5** **(xi)** Perfect squares end only in 0,1,4,5,6,9 — never in 7 **Answer: (c) 7** **(xii)** A number leaving remainder 5 on division by 9 **Answer: (a) 9k + 5**	
	SECTION-B (Q2–7, 2 marks each)	
2	**Q2** $\sqrt{1750} \approx 41.8$; $42^2 = 1764$ 1764 − 1750 **Answer: 14**	*2 marks*
3	**Q3** $(4^{-1} \times 4^3) \div 4^0 = 4^2 \div 1$ **Answer: 16**	*2 marks*
4	**Q4** 5x+7x=180 → 12x=180 → x=15 Angles: 5(15)=75°, 7(15)=105° **Answer: 75° and 105°**	*2 marks*
5	**Q5** **(a)** DCC=700, XL=40, V=5 700+40+5 **Answer: 745** **OR (b)** Multiples of 8 between 100-200 with digit sum 9: check each 144: digit sum 1+4+4=9 ✓ **Answer: 144**	*2 marks*
6	**Q6** Workers × days = constant = 60 60 ÷ 15 **Answer: 4 days**	*2 marks*
7	**Q7**	*2 marks*

Q.No	Step-by-Step Solution	Marks per Step
	SECTION – A (Q1, subparts i–xii, 1 mark each)	
	$9m^2-4n^2 = 9(25)-4(9) = 225-36$ **Answer: 189**	
	SECTION-C (Q8–10, 3 marks each)	
8	**Q8** **(i)** DXLIV=544, CCXIX=219 544+219=763 **Answer: DCCLXIII** **(ii)** MCDXLIV=1444, DXII=512 1444+512=1956 **Answer: MCMLVI**	*1.5 marks each*
9	**Q9** **(a)** Vertically opposite: ∠ROS = 68° Adjacent angles: (360−136)÷2 **Answer: ∠ROS=68°, ∠QOR=∠SOP=112° each** **OR (b)** Opposite angles equal: 4x−10 = 2x+30 2x=40 → x=20 ∠W=∠Y=70°, ∠X=∠Z=110° **Answer: x=20; angles 70°, 110°, 70°, 110°**	*3 marks*
10	**Q10** **(i)** $(5a)^2+2(5a)(2b)+(2b)^2 = 25a^2+20ab+4b^2$ **Answer: $25a^2 + 20ab + 4b^2$** **(ii)** $7^2-(2x)^2 = 49-4x^2$ **Answer: $49 - 4x^2$**	*1.5 marks each*
	SECTION-D (Q11–13, 5 marks each)	
11	**Q11** **(i)** $6750 = 2 \times 3^3 \times 5^3$ The exponent of 2 (which is 1) breaks the pattern; divide by 2 $6750 \div 2 = 3375 = 15^3$	*3+2 marks*

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	Answer: Divide by 2; cube root of quotient = 15 **(ii)** $\sqrt{20.25} = \sqrt{(81/4)} = 9/2$ **Answer: 4.5 m**	
12	**Q12** **Main (i):** $9^{x+1-2x+1} = 9^{2-x}$ **Answer: 9^{2-x}** **Main (ii):** $m^{-3}=1/64=1/4^3 \rightarrow m^3=64$ **Answer: m = 4** **OR (i):** $(6^{-1}\times6^4)\div6^2 = 6^3\div6^2=6^1$ **Answer: 6** **OR (ii):** $4^p=1/16=4^{-2}$ **Answer: p = −2**	*2.5+2.5 marks*
13	**Q13** **(i)** Try XY=49: 49 × 6 = 294 (reversed digits give X=4,Y=9,Z=2) **Answer: X=4, Y=9, Z=2** **(ii)** 7p3q5 ends in 5 (div by 5 automatically); need digit sum 15+p+q divisible by 3 **Answer: e.g. (p,q) = (0,0), (0,3), (1,2) — 34 valid pairs in total** **(iii)** Must be divisible by both 2 and 5, i.e. by 10 **Answer: General form: 10k**	*2+2+1 marks*
	SECTION-E (Q14–16, case-based, 4 marks each)	
14	**Q14** **(i)** ∠BPC and ∠APB form a linear pair: 180 − 124 **Answer: ∠BPC = 56°** **(ii)(a):**	*1+2+1 marks*

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	∠CPD is vertically opposite to ∠APB **Answer: ∠CPD = 124°** **(ii)(b) OR:** ∠DPA is vertically opposite to ∠BPC **Answer: ∠DPA = 56°** **(iii)** Diagonals of a rectangle bisect each other: AC = 2 × AP = 2 × 5 **Answer: AC = 10 cm**	
15	**Q15** **(i)** (60−1)(60+1) = 3600−1 **Answer: 3599** **(ii)** (90−2)(90+2) = 8100−4 **Answer: 8096** **(iii)(a):** (4−0.1)(4+0.1) = 16−0.01 **Answer: 15.99** **(iii)(b) OR:** $(3+4)^2 = 49$; $3^2+4^2 = 9+16 = 25$ The difference (24) is the missing 2ab cross term: 2(3)(4)=24, and 25+24=49 **Answer: $(a+b)^2 \neq a^2+b^2$; the missing term is 2ab**	*1+1+2 marks*
16	**Q16** **(i)** 250 ÷ 4 × 18 **Answer: 1125 g** **(ii)** 1000 ÷ 250 × 4 **Answer: 16 people** **(iii)(a):** 250 ÷ 4 × 30 **Answer: 1875 g** **(iii)(b) OR:**	*1+1+2 marks*

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	4×625=2500; 250×10=2500 — equal **Answer: Yes, they are in proportion**	