



Problem Solving & Logic Quest

Name: _____

Grade: 5

Date: _____

Tackle multi-step real problems using operations, logical deduction, pattern rules, estimation, and error checking. Show thinking—NOT just answers.

Part 1 · Multi-Step Operations

STEPS

1. A bakery sold 486 muffins morning and 379 afternoon; 128 were blueberry. Non-blueberry total = _____

2. A library had 12,450 books; added 3 shipments of 875 each, then removed 640 damaged. New total = _____

3. A warehouse has 48 crates; each crate has 36 boxes; each box 12 items. Total items = _____

4. Field trip: 7 buses $\times$ 52 seats. 328 students go. Empty seats = _____

5. Two stores sell 1,208 and 1,356 game cards weekly. Estimate (nearest hundred) then exact difference: Est $\approx$ _____ ; Exact = _____

6. 9 pallets weigh 275 kg each; add a 132 kg machine. Combined weight = _____ kg

Part 2 · Patterns & Expressions

PATTERN

7. Sequence: 5, 11, 17, 23, ____ (rule?) Next = _____ ; rule: add _____

8. Sequence: 3, 6, 12, 24, ____ Next = _____ ; rule: $\times$ _____

9. Term n rule: $T(n)=4n+3$. $T(5)=$ _____

10. If $T(n)=2n^2$, $T(4)=$ _____

11. Expression: "7 less than triple x " = _____

12. Evaluate $3(a+5)$ when $a=9$:

Part 3 · Logical Reasoning

LOGIC

13. Three numbers: sum 42. Two are 15 and 11. Third = _____

14. A number doubled then $+18 = 90$. Original number = _____

15. Product of two equal numbers is 256. Each number = _____

16. The mean of 6, 8, x , 10 is 9. Find $x =$ _____

17. You subtract a number from 1,000 and get 472. Number subtracted = _____

18. Two consecutive multiples of 7 sum to 105. Larger multiple = _____

Part 4 · Data & Geometry Blend

BLEND

19. Rectangles: A 8×5 ; B 10×4 . Area difference = _____

20. A bar chart shows counts: 24, 30, 18. Average = _____

21. Line plot lengths (cm):
4,4,5,5,5,6,6. Median = _____ ;

22. Perimeter of 12×9 rectangle = _____

Mode = _____

23. Volume of $6 \times 4 \times 5$ prism = _____

24. If volume above doubles only height, new height = _____

Part 5 · Real-Life Scenarios REAL

CAMP 25. Camp served 185 lunches Monday, 212 Tuesday, 198 Wednesday. Average (nearest whole) lunches/day = _____

SHOP 26. Sale: buy 4 markers at \$3 each & 3 notebooks at \$5 each. Total = \$_____

GARDEN 27. Two garden beds: 3×8 and 4×6 . Combined area = _____ ; difference = _____

FUEL 28. Car tank 48 L. Used 18 L then 7 L. Liters left = _____ (% left nearest %) = _____%

SAVINGS 29. Saved \$45, needs \$120. Percent of goal saved (nearest %) = _____%

TECH 30. Device memory 256 GB; 83 GB used apps, 92 GB media. Free GB = _____

Part 6 · Error Analysis FIX

31. Error: Student added $486 + 379$ and got 845. Correct sum & error type = _____ / _____

32. Error: Interpreted "7 less than triple x" as $7 - 3x$. Correct expression & reason = _____ / _____

33. Error: For mean of 6,8,x,10 = 9 they divided $6+8+10$ by 9. Correct x = _____ ; fix = _____

Part 7 · Challenge Problems

CHALLENGE

34. Small cube volume 64 cm^3 . Edge length = _____ cm

35. Find n: $3n + 48 = 117 \rightarrow n =$ _____

36. Pattern adds +6 each step starting at 9. 10th term = _____

37. If $T(n)=5n-2$, solve $T(n)=73$. $n =$ _____

38. Two numbers differ by 38 and sum to 166. Larger = _____

39. A 12×9 rectangle scaled by 150% (each dimension $\times 1.5$). New area = _____

Part 8 · Reflection & Metacognition

REFLECT

40. Which strategy (estimate / draw / table / equation) helped most?

41. One spot you re-checked & caught an error: _____



42. Goal: Next time I will improve at _____

Reflection answers vary—credit thoughtful responses.

Answer Key

1. $486+379-128=737$
2. $12,450+3\times 875-640=14$, $(12,450+2,625=15,075-640)=14,435$
3. $48\times 36\times 12=20,736$
4. $7\times 52=364$; $364-328=36$
5. Est $\approx 1,200-1,400\rightarrow 200$; Exact $1,356-1,208=148$
6. $9\times 275+132=2,607$
7. 29 ; 6
8. 48 ; 2
9. $4(5)+3=23$
10. $2(16)=32$
11. $3x-7$
12. $3(9+5)=42$
13. $42-(15+11)=16$
14. $(90-18)/2=36$
15. $\sqrt{256}=16$
16. Mean 9 $\rightarrow (6+8+x+10)=36 \rightarrow x=12$
17. $1,000-472=528$
18. Let $7k+7(k+1)=105 \Rightarrow 14k+7=105 \Rightarrow 14k=98$ $k=7 \Rightarrow$ larger 56
19. $8\times 5=40$; $10\times 4=40$ diff 0
20. $(24+30+18)/3=24$
21. Order: 4,4,5,5,5,6,6 Median=5 Mode=5
22. $2(12+9)=42$
23. $6\times 4\times 5=120$
24. $\text{Volume}\times 2 \Rightarrow \text{height } 5\rightarrow 10$
25. $(185+212+198)=595 \div 3 \approx 198$
26. $4\times 3 + 3\times 5 =12+15=27$
27. $3\times 8 + 4\times 6 =24+24=48$; diff 0
28. $48-25=23$; $23/48\approx 48\%$
29. $45/120=37.5\%\approx 38\%$
30. $256-(83+92)=81$
31. $486+379=865$ / place value carry
32. $3x-7$ / order: triple then subtract
33. $x=12$ / average total=mean $\times$ count
34. $\sqrt[3]{64}=4$
35. $(117-48)/3=23$
36. Term $n=9+6(n-1)$; $n=10 \Rightarrow 9+54=63$
37. $5n-2=73 \Rightarrow 5n=75 \Rightarrow n=15$
38. $(166+38)/2=102$

39. Area scale factor $(1.5)^2=2.25 \Rightarrow 108 \times 2.25=243$

40. Varies

41. Varies

42. Varies

#2 arithmetic: $12,450+2,625=15,075-640=14,435$. #25 average nearest whole. #27 & #19 difference zero (equal).
Reflection items vary. Accept equivalent reasoning descriptions.