

2026 UIL ELEMENTARY CALCULATOR CONTEST – GRADE 3 NOVICE SPRINT – OFFICIAL SCORING KEY

CANONICAL ANSWERS (3 SIGNIFICANT DIGITS) • SCIENTIFIC NOTATION • GRADING TOLERANCES [PAGE 1 OF 4]

#	OFFICIAL CONTEST ANSWER (3 SIG FIGS)	SCIENTIFIC NOTATION	ACCEPTANCE INTERVAL (±2 UNITS)
1	637 [INT]	6.37×10^2	[637]
2	475 [INT]	4.75×10^2	[475]
3	488 [INT]	4.88×10^2	[488]
4	912 [INT]	9.12×10^2	[912]
5	38 [INT]	3.80×10^1	[38]
6	\$52.65	5.26×10^1	[52.4, 52.9]
7	98 [INT]	9.80×10^1	[98]
8	1440 [INT]	1.44×10^3	[1440]
9	\$7.90	7.90×10^0	[7.88, 7.92]
10	41.0 ft	4.10×10^1	[40.8, 41.2]
11	0.750	7.50×10^{-1}	[0.748, 0.752]
12	0.375	3.75×10^{-1}	[0.373, 0.377]
13	0.833	8.33×10^{-1}	[0.831, 0.835]
14	0.300	3.00×10^{-1}	[0.298, 0.302]
15	0.800	8.00×10^{-1}	[0.798, 0.802]
16	0.500	5.00×10^{-1}	[0.498, 0.502]
17	0.667	6.67×10^{-1}	[0.665, 0.669]
18	9 [INT]	9.00×10^0	[9]
19	27 [INT]	2.70×10^1	[27]
20	0.600 m	6.00×10^{-1}	[0.598, 0.602]
21	4.00 hrs	4.00×10^0	[3.98, 4.02]
22	2.75 hrs	2.75×10^0	[2.73, 2.77]
23	2.33 hrs	2.33×10^0	[2.31, 2.35]
24	4.00 hrs	4.00×10^0	[3.98, 4.02]
25	6 [INT] hrs	6.00×10^0	[6]

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CANONICAL ANSWERS (3 SIGNIFICANT DIGITS) • SCIENTIFIC NOTATION • GRADING TOLERANCES [PAGE 2 OF 4]

#	OFFICIAL CONTEST ANSWER (3 SIG FIGS)	SCIENTIFIC NOTATION	ACCEPTANCE INTERVAL (±2 UNITS)
26	74.0 cm	7.40×10^1	[73.8, 74.2]
27	45.2 cm	4.52×10^1	[45.0, 45.4]
28	81.0 m	8.10×10^1	[80.8, 81.2]
29	90 [INT] min	9.00×10^1	[90]
30	4.00 hrs	4.00×10^0	[3.98, 4.02]

STACKCALC32 RPM BENCHMARK: 174 KEYSTROKES vs. 264 ALGEBRAIC (SAVING 90 KEYS, 34.1% FASTER)

GRADER 1 INITIALS: _____ GRADER 2 INITIALS: _____ CONTEST DIRECTOR: _____

SCORING RULE: +5 points for each correct answer; -4 points for each error or skipped question up to last attempted.

PART II: DETAILED WORD PROBLEM & GEOMETRY WORKED SOLUTIONS

Formal Mathematical Modeling, Formula Setups & StackCalc RPN Keystroke Workflows

PROBLEM 9 • MULTI-ITEM CALCULATOR & COMPONENT ORDERS**ANSWER: \$7.90**

Maya purchases a tactile block building plate for \$6.85 and 3 mechanical calculator switch keycaps for \$1.75 each. How much change does she receive from a \$20.00 bill?

GOVERNING MODEL: $\text{Total Cost} = (n_1 \times p_1) + (n_2 \times p_2)$

NUMERICAL SETUP: $\text{Total} = (\text{Count}_1 \times \text{Price}_1) + (\text{Count}_2 \times \text{Price}_2)$

STEP-BY-STEP MATHEMATICAL REASONING:

Compute subtotal for each item type (calculator, modular blocks, sensors) by multiplying count by unit price, then sum together. Round currency to two decimals [\$].

CALCULATOR FLOW: [20] [ENTER] [6.85] [-] [3] [ENTER] [1.75] [×] [-] -> \$7.90

PROBLEM 10 • CHASSIS FACEPLATE & BUILD MAT PERIMETER**ANSWER: 41.0 ft**

A silicone 3D printer build plate mat is 8.50 feet wide and 12.0 feet long. Calculate its perimeter in feet.

GOVERNING MODEL: $\text{Perimeter} = 2 \times (\text{Length} + \text{Width})$

NUMERICAL SETUP: $P = 2 \times (L + W)$

STEP-BY-STEP MATHEMATICAL REASONING:

Perimeter of the rectangular chassis faceplate or silicone build mat is twice the sum of length and width: $P = 2 \cdot (L + W)$. Add dimensions and multiply by 2.

CALCULATOR FLOW: [8.5] [ENTER] [12] [+] [2] [×] -> 41.0 ft

PROBLEM 19 • FRACTIONAL SUBSET AGGREGATION (MODULAR BLOCKS)**ANSWER: 27 [INT]**

A Stack Stage tactile block kit contains 36 interlocking math blocks. If $\frac{1}{4}$ of the blocks are blue and $\frac{1}{2}$ are yellow, how many blocks are either blue or yellow?

GOVERNING MODEL: $\text{Count} = \text{Total Blocks} \times (\text{Fraction}_1 + \text{Fraction}_2)$

NUMERICAL SETUP: $\text{Count} = N \times (f_1 + f_2)$

STEP-BY-STEP MATHEMATICAL REASONING:

Sum the fractional subsets together (e.g. $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$) and multiply by total block count N in the Stack Stage kit.

CALCULATOR FLOW: [36] [ENTER] [4] [÷] [36] [ENTER] [2] [÷] [+] -> 27 [INT]

PROBLEM 20 • 3D PRINTING FILAMENT & LINEAR DENSITY**ANSWER: 0.600 m**

Leo has a strip of flexible 3D printer TPU wire measuring $\frac{4}{5}$ meter. He cuts off $\frac{1}{5}$ meter for a tactile hinge prototype. What fraction of a meter of TPU wire remains?

GOVERNING MODEL: $\text{Length} = \text{Total Mass} / \text{Linear Density}$ [with kg -> g conversion]

NUMERICAL SETUP: $\text{Length (m)} = [\text{Mass (kg)} \times 1000 \text{ g/kg}] / \text{Linear Density (g/m)}$

STEP-BY-STEP MATHEMATICAL REASONING:

Convert spool shipping mass from kg to grams (multiply by 1,000). Divide total grams by filament linear density in grams per meter to obtain total printable filament length in meters.

CALCULATOR FLOW: [4] [a b/c] [5] [ENTER] [1] [a b/c] [5] [-] -> 0.600 m

PROBLEM 29 • ELAPSED MACHINE CYCLE TIME CALCULATION**ANSWER: 90 [INT] min**

An educational 3D printer modular block print job starts at 9:15 am and finishes at 10:45 am. How many total minutes did the print job take?

GOVERNING MODEL: Elapsed Time = End Time - Start Time

NUMERICAL SETUP: $\Delta t = T_{\text{finish}} - T_{\text{start}}$

STEP-BY-STEP MATHEMATICAL REASONING:

Compute total elapsed duration between start and completion timestamps, expressing duration in hours or minutes.

CALCULATOR FLOW: [10.45] [ENTER] [9.15] [CLK-] [60] [×] -> 90 [INT] min

PROBLEM 30 • CUMULATIVE MACHINE OPERATING HOURS**ANSWER: 4.00 hrs**

An automated electronics test bench runs for 48.0 minutes each morning. How many total hours does it run over a 5-day school week?

GOVERNING MODEL: Total Hours = (Daily Minutes × Days) / 60 min/hr

NUMERICAL SETUP: Hours = (Minutes/day × 5 days) / 60

STEP-BY-STEP MATHEMATICAL REASONING:

Multiply daily operating duration in minutes by 5 school days to get weekly minutes, then divide by 60 to convert to hours.

CALCULATOR FLOW: [48] [ENTER] [5] [×] [60] [÷] -> 4.00 hrs