

2026 UIL / TMSCA JUNIOR HIGH CALCULATOR CONTEST – GRADE 7 CHAMPIONSHIP

GRADE 7 JUNIOR HIGH DIVISION • 50 PROBLEMS • 30-MINUTE SPEED SPRINT • SC-6 / SC-32

// OFFICIAL CONTESTANT IDENTIFICATION

CONTESTANT NAME: _____

SCHOOL / CAMPUS: _____

GRADE LEVEL: [] 6 [] 7 [] 8

CONTESTANT ID #: _____

OFFICIAL SCORING GRID (GRADER VERIFIED)						
PAGE	P1	P2	P3	P4	P5	TOTAL
Correct (+5):						
Errors (-4):						
Subtotal:						

CONTEST RULES: 30 MINUTES • ALL ANSWERS TO 3 SIGNIFICANT DIGITS UNLESS INTEGER [INT] OR DOLLARS [\$].
SCORING: +5 points per correct response; -4 points per wrong/skipped question up to last attempted. Zero after last attempted.

SECTION 1: SIGNED RATIONAL OPERATIONS & CHAINS

Negative & Positive Rationals, Order of Operations, Grouping & Multi-Step Fractions

MODE: [123] RATIONALS

- G7-1.

$(-48.5) + 112.4 - 28.6$

1 = _____
- G7-2.

$(-14.2) \times 8.5$

2 = _____
- G7-3.

$(-225.0) \div (-7.5)$

3 = _____ INT
- G7-4.

$(34.5 - 78.2) \times (-4.6)$

4 = _____
- G7-5.

$(-18.4) + (-32.6) - (-55.0)$

5 = _____
- G7-6.

$[(-42.0) \times 15.5] / (8.5 - 24.5)$

6 = _____
- G7-7.

$(-3.5) \times (-4.2) \times (-2.0)$

7 = _____
- G7-8.

$(18.5 - 94.2) / 6.5$

8 = _____
- G7-9.

A 3D printer thermal environmental chamber tests an electronics enclosure at an initial sub-zero temperature of -14.5°C . During active printing, the chamber temperature rises by 22.8°C , and then cools by 11.2°C during post-print curing. What is the final chamber temperature in $^{\circ}\text{C}$?

9 = _____ $^{\circ}\text{C}$
- G7-10.

A CNC milling machine vertical spindle is zeroed at -185.0 meters below a high reference. It ascends 64.0 meters for clearance, then descends 92.5 meters. What is the spindle's final depth in meters relative to the reference?

10 = _____ m

SECTION 2: PROPORTIONAL RELATIONSHIPS & RATESConstant of Proportionality ($k=y/x$), Complex Fraction Rates & Unit Price Comparisons

MODE: [123] PROPORTIONS

- G7-11.** $(3/4) \div (2/5)$ **11** = _____
- G7-12.** $(5/8) \div (15/16)$ **12** = _____
- G7-13.** Constant of proportionality: $184 / 8$ **13** = _____ INT
- G7-14.** Proportion: $x/15 = 48/60$ **14** = _____ INT
- G7-15.** Proportion: $24/x = 36/54$ **15** = _____ INT
- G7-16.** Unit rate: $312 \text{ miles} / 4.80 \text{ hours}$ **16** = _____ mph
- G7-17.** Unit cost: $\$42.50 / 8.50 \text{ kg}$ **17** = _____ \$
- G7-18.** Scale factor: $18.0 \text{ cm} / 4.50 \text{ cm}$ **18** = _____ INT
- G7-19.** An automated pick-and-place surface mount machine places 420 SMD capacitors onto PCB boards in 14.0 minutes. At this steady rate, how many components can the machine place in 35.0 minutes?
19 = _____
- G7-20.** An electronics CAD layout of a modular calculator chassis uses a zoom scale of 0.500 inches = 8.00 feet. If an internal battery pocket measures 2.25 inches long on screen, what is the actual battery pocket length in feet?
20 = _____ ft

SECTION 3: PERCENTS, TAX & SIMPLE INTEREST

Simple Interest (I=Prt), Sequential Discounts, Gratuity & Percent Error

MODE: [%] PERCENT

- G7-21.** Simple interest: $\$3500 \times 0.045 \times 3 \text{ yrs}$ **21 =** _____ \$
- G7-22.** Simple interest: $\$8200 \times 0.062 \times 2.5 \text{ yrs}$ **22 =** _____ \$
- G7-23.** Total balance: $\$5000 + (\$5000 \times 0.05 \times 4)$ **23 =** _____ \$
- G7-24.** Sale price: $\$140.00 \times (1 - 0.30)$ **24 =** _____ \$
- G7-25.** Price with tax: $\$85.00 \times (1 + 0.0825)$ **25 =** _____ \$
- G7-26.** Discounted + tax: $\$120.00 \times 0.80 \times 1.0825$ **26 =** _____ \$
- G7-27.** Percent error: $|145 - 138| / 138 \times 100$ **27 =** _____ %
- G7-28.** Commission: 6.5% of \$48,000 **28 =** _____ \$
- G7-29.** An educational robotics lab equipment fund deposits \$6,400 at an annual simple interest rate of 5.25%. How much total interest in dollars is earned after 4.50 years?
29 = \$ _____
- G7-30.** An electronics component supplier order totals \$84.50 before tax. An 8.00% local tax is added, and the buyer selects an 18.0% priority handling fee on the pre-tax order. What is the total dollar expenditure?
30 = \$ _____

SECTION 4: CIRCLES, AREA & COMPOSITE 2D FIGURESCircumference ($2\pi r$), Circle Area (πr^2), Semicircles, Trapezoids & Composite Shapes

MODE: [123] GEOMETRY

- G7-31.** Circumference: $2 \times \pi \times 18.4$ **31** = _____ cm
- G7-32.** Circumference: $\pi \times 42.6$ **32** = _____ m
- G7-33.** Circle Area: $\pi \times 12.5^2$ **33** = _____ m²
- G7-34.** Circle Area: $\pi \times (28.4 / 2)^2$ **34** = _____ cm²
- G7-35.** Semicircle Area: $(1/2) \times \pi \times 9.4^2$ **35** = _____ m²
- G7-36.** Trapezoid Area: $1/2 \times (18.5 + 31.5) \times 14.0$ **36** = _____ m²
- G7-37.** Parallelogram Area: 28.5×16.4 **37** = _____ cm²
- G7-38.** Composite: $(24.0 \times 15.0) + (1/2 \times \pi \times 7.5^2)$ **38** = _____ m²
- G7-39.** A circular stepper motor encoder ring on a 3D printer has an inside radius of 36.0 meters. What is the total perimeter in meters of one complete lap around the inside edge?
39 = _____ m
- G7-40.** A 3D printed calculator faceplate measures 18.0 feet long and 12.0 feet high. A circular cutout for a rotary dial encoder with a radius of 3.50 feet is excised from the center. Calculate the remaining faceplate area in square feet.
40 = _____ ft²

SECTION 5: MULTI-STEP ALGEBRAIC & RATE LABS

Two-Step Linear Equations, Surface Area of Prisms & Travel Time Conversions

MODE: [123] APPLIED RATES

- G7-41.** Solve: $4x + 18.5 = 78.5 \rightarrow x$ **41** = _____ INT
- G7-42.** Solve: $2.5(x - 6.0) = 45.0 \rightarrow x$ **42** = _____ INT
- G7-43.** Triangular prism vol: $(1/2 \times 8.4 \times 6.5) \times 18.0$ **43** = _____ cm^3
- G7-44.** Rect prism surface area: $2(14 \times 9 + 14 \times 6 + 9 \times 6)$ **44** = _____ cm^2
- G7-45.** $(18.5 + 24.2 + 31.8 + 19.5) / 4$ **45** = _____
- G7-46.** $1 / (1/14.0 + 1/21.0)$ **46** = _____
- G7-47.** $(45 \times 18.5) - (25 \times 14.2)$ **47** = _____
- G7-48.** $240 \text{ km} \div 80 \text{ km/h} \times 60 \text{ min}$ **48** = _____ min
- G7-49.** A 3D printer heated build volume chamber measures 32.0 inches long, 14.0 inches wide, and 18.0 inches deep. If 1.00 cubic foot equals 1,728 cubic inches, what is the chamber's volume in cubic feet?
49 = _____ ft^3
- G7-50.** Two stepper motors drive pick-and-place gantry heads outward from center in opposite directions at constant speeds of 52.0 mph and 46.0 mph. In how many hours will they be 245 miles apart?
50 = _____ hrs