

**ENTRIES.** As many as **THREE** students from a **COMBINATION OF GRADES 6, 7 AND 8** (ages 11, 12, and 13 by Sept. 1 of the current school year, if in an ungraded school, may be entered in the Calculator Applications District Contest from each school. Adults from each school select contestants to represent the campus at the District Meet based on their abilities and interest in math calculations, as well as other factors, which are decided upon by each school.

• **ADVANCING TO STATE.** 4 must compete in the contest for 2 to advance (See page 8 for complete rules.)

• **NATURE OF THE CONTEST.** The contest presents 80 problems in straight-forward numerical calculation, in calculations based upon geometrically presented problems, and in word problems. Both accuracy and speed are factors in the competition. Any silent, hand-held, tapeless calculator may be used and should be brought to contest. Geometric problems involve knowledge of formulas for simple figures such as circles, squares, rectangles, and right triangles. Word problems require application of appropriate mathematical skills and practical knowledge to real-life situations.

• **WHAT HAPPENS IN THE CONTEST.** The contest director will announce the time and place that contestants and one adult should report for verification of the scoring of tests. Contestants will be assisted by the director and assistant(s) in clearing all calculator memories and turning calculators to the “off” position. The contest director will tell contestants their ID numbers, usually during roll call. Tests will be distributed to contestants face up, and contestants will be instructed to write their grade levels and their contestant ID numbers in the spaces provided on the front cover. Contestant must not open the test until the start signal is given. (Substitutes taking the place of absent registered contestants should let the contest director know as they enter the room to save time in roll call.) No alarm watches or other devices that emit sound are allowed in the contest room.

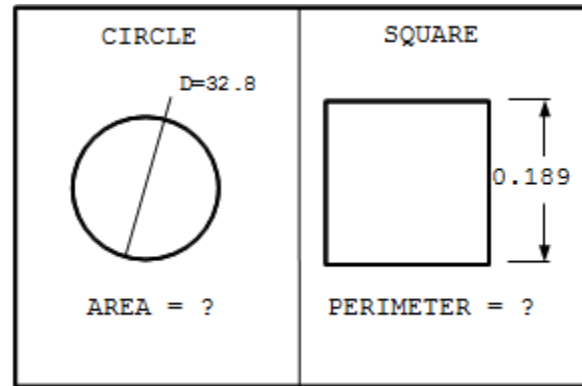
• **SAMPLE PROBLEMS.** Representative problems of medium difficulty are provided below:

$$6.95 + 9.58 - 8.6 + 89.6$$

$$[7.55 - (0.154) / (0.247)] + [(5.35)(0.382) - (0.525)]$$

Bob decides to treat his 26 co-workers by giving them 4 mini-candy bars each. How many mini-candy bars will Bob need? \_\_\_\_\_ integer

Zoey rides her bike 200 meters due north, then rides twice as far to the east, and finally rides straight back to her starting point. If she rides at the speed of 42 meters per minute, how long does her round-trip take?  
 \_\_\_\_\_ minutes



**TIME ALOTTED.** Contestants will have 30 minutes beginning at the start signal. No time warning will be given. Contestants will remain quietly in their seats until the time has expired.

**MARKING ANSWERS.** Contestants may write on the test paper, but only the answer should be written in the answer space. Any marking or erasure in the answer space will constitute an attempt. Answers may be written in decimal or in powers of 10 notation of the form,  $1.23 \times 10^{-6}$ . Except in the integer and dollar sign problems, answers should be written with three significant digits only, with plus or minus one digit error in the third significant digit permitted. Integer problems require answers written as an integer, and no error is permitted. Dollar sign problems should be answered to the exact cent, but plus or minus one cent error is permitted. Answers should be given in the units specified on the answer blank, if a unit is required, and with the correct sign. All test questions up through the last one attempted, including an erased attempt, will be scored.

• **SCORING.** Add 5 points for each correct answer. Subtract 2 points for each wrong answer, every skipped test question, and for each answer that was marked through or erased, without resulting in a correct answer.

• **VERIFICATION PERIOD.** Contestants and ONE coach OR parent OR adult have 15 minutes to check the computation of scores and ask questions about items counted incorrect. If the contest is held before **March 27**, tests must be turned back in to the contest director. (See page 13 for full Verification rules.)

• **MATERIALS.**

Last year’s PSIA Calculator Applications tests and answer keys, plus tests from previous PSIA contests, are available on Study Materials Order Form and Tests Order Form found in the appendix of the handbook and on the PSIA website.

**A Commonly Asked Question**

Q. If the answer to a question is  $3.68 \times 10^1$ , would the answer be correct if it were given as  $3.68 \times 10$  with the (1) omitted?

A.  $3.68 \times 10^1$ ,  $3.68 \times 10$  and 36.8 are correct answers.  $3.68E1$ ,  $3.68 \cdot 10^1$  and  $36.8 \times 10^0$  are incorrect.

See Scoring Instructions on the following pages.



# Grading the Calculator Applications Test

## Punch Problems and Geometry Problems:

- Must use 3 significant digits
- Can use regular notation OR scientific notation
- Must be formatted in one of the following acceptable forms:  
 $12.3$ ,  $123$ ,  $123.$ ,  $1.23 \times 10^1$ ,  $1.23 \times 10$ ,  
 $1.23 \times 10^0$ ,  $1.23 \times 10^{01}$ ,  $.0190$ ,  $0.0190$ ,  $1.90 \times 10^{-2}$
- Cannot be in any of the following forms:

Incorrect Answer	Reason	Incorrect Answer	Reason
12.30	4 significant digits (0 is significant when behind the decimal point)	$1.230 \times 10^2$	4 significant digits (0 is significant when behind the decimal point)
123.0	4 significant digits (0 is significant when behind the decimal point)	0.19	2 significant digits (0 is not significant before the first non-zero digit)
$1.23(10)^2$	Incorrect form for scientific notation	$1.9 \times 10^{-2}$	2 significant digits
$1.23 \cdot 10^2$	Incorrect form for scientific notation (dot for multiplication is not permitted)	$19.0 \times 10^{-3}$	Incorrect scientific notation form (Must be exactly one digit before the decimal point)
$1.23 * 10^2$	Incorrect form for scientific notation (star for multiplication is not permitted)	1.90E-02	Incorrect scientific notation form

- The third significant digit can be off by  $\pm 1$ . For example, if the correct answer is 48000, then both student responses of 47900 and 48100 would be counted correct.

## Word Problems:

- All word problems follow the rules for Punch Problems and Geometry Problems except for Integer problems and Money Problems.
- Integer problems are denoted by “(integer)” in the answer blank. Answers must be exact integers and cannot be written in scientific notation. No error in the last digit is permitted. No decimals are permitted.
- Money problems with dollar signs must be accurate to the penny. These answers cannot be written in scientific notation. Students are allowed a  $\pm$  one cent error in their answers.

**Practice**

Determine which of the following answers are correct based on the answer key given.

<b>Student Responses Punch Problems &amp; Geometry Problems</b>	<b>Answer Key</b>
....1: 8.44	1: 8.54 8.54×10 <sup>0</sup>
....2: 56700	2: 56600 5.66×10 <sup>4</sup>
....3: 3.982×10 <sup>2</sup>	3: 398 3.98×10 <sup>2</sup>
....4: 819×10 <sup>5</sup>	4: 819000 8.19×10 <sup>5</sup>
....5: 5.67 · 10 <sup>-03</sup>	5: 0.00567 5.67×10 <sup>-3</sup>
<b>Word Problems</b>	
....6: 48392 (integer)	6: 48393 (integer)
....7: \$ 45.20	7: \$ 45.19
....8: 312900 gallons	8: 313000 3.13×10 <sup>5</sup>

**ANSWERS:** 1. Wrong – off in the second significant digit. 2. Correct – off in third significant digit by 1. 3. Wrong – too many significant digits. 4. Wrong – no decimal point. 5. Wrong – dot notation not permitted. 6. Wrong – integers must be exact. 7. Correct – money problems with dollars can be off by one cent. 8. Wrong – too many significant digits