

• **ENTRIES.** As many as THREE students from EACH GRADE LEVEL (grades 4, 5, 6, 7 and 8) OR ages 9, 10, 11, 12 and 13 by Sept. 1 of the current school year, if in an ungraded school, may be entered in the MATHEMATICS District Contest from each school. Designated adults representing each school will select contestants to represent the campus at the District Meet based on their abilities in mathematics, and other factors, which are decided upon by each school. Each grade level is judged separately in contest.

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

• **NATURE OF THE CONTEST.** The Mathematics contest tests the contestant's ability to solve a variety of mathematical problems studied at and above grade level. No loose papers or other materials are allowed. Calculators are NOT permitted for use in the contest. The test for grades 4 and 5 consists of 40 problems. The test for grades 6-8 consists of 50 problems. Test questions are similar to those found in state-adopted textbooks, but many items are usually tested at a higher grade level. For the grades 6-8 contest, approximately 25% of the problems will require knowledge of Algebra I computation skills. All tests will contain problems covering, but not limited to, numeration systems, arithmetic operations involving whole numbers, integers, fractions, decimals, exponents, order of operations, probability, statistics, number theory, simple interest, measurements (English and metric), and conversions normally covered (feet to inches, quarts to gallons, etc.). There will also be geometry problems normally covered in the middle school student's textbooks, including application of the Pythagorean theorem. Normal geometry problems will include finding area and volume of polygons/polyhedra and circles/spheres. Various types of problems are randomly distributed throughout the test. **All contest materials, other than the test itself, must be supplied by the contestant.**

• **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. Tests and answer sheets 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 of the test and on the answer sheet. Contestants must not open the test until the start signal is given. The contest director will tell contestants their ID numbers, usually during roll call. (Alternates taking the place of absent registered contestants should be sure to 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. Contestants may use any white spaces on the test to assist in computing answers. No additional paper will be provided. All contest materials, other than the test itself, must be supplied by the contestant.

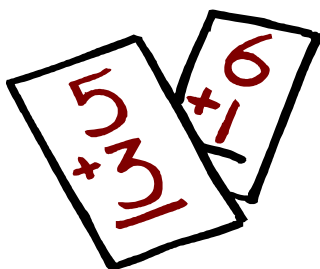
**TIME ALOTTED.** When the start signal is given, contestants will have 30 minutes to answer test questions. Contestants will remain quietly in their seats until the time has expired.

**MARKING ANSWERS.** Contestants may write on the test paper, but only the CAPITAL letter answer should be written in the answer space on the answer sheet. Any marking in the answer space will constitute an attempt. Contestants may place an X in the box provided where an erasure, mark-out, or undesired answer has occurred in order to not have points deducted for these errors. (See page 12 for Skipping X-box examples.)

• **SCORING.** Add 5 points for each correct answer. Subtract 2 points for each incorrect answer, or for each answer that was attempted, marked through or erased, and did not result in a correct answer. **No points** are added or deducted for skipped or unanswered test items, or erased, marked-out, or answered items when an X is placed in the box beside the answer blank.

• **VERIFICATION PERIOD.** No pens, pencils, papers, cell phones, or any other items should be in contestants' area while tests and answer sheets with keys are reviewed **QUIETLY**. 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. Contestants will be disqualified from the contest should the paper be taken from the room prior to this date. After verification has been completed, awards will be issued. (See page 13 for complete rules for Verification Period.)

• **MATERIALS.** Last year's PSIA Mathematics tests and answer keys, plus tests from previous PSIA contests, are included in the PSIA Academic Study Materials Booklets, which may be ordered from the PSIA office. A PSIA Study Materials Order Forms for these booklets are included in the appendix of this handbook.



### Sample Level 4/5 Mathematics Problems

- $2 + 8 + 4 + 6 + 3 + 7 =$   
A) 18    B) 40    C) 30    D) 28    E) none of these
- Elizabeth has eighteen marbles. She gives three marbles to Matthew and nine marbles to Daniel. How many marbles does Elizabeth have left?  
A) 5    B) 4    C) 12    D) 6    E) none of these
- Olivia wanted to save up enough money to buy her mother a birthday gift that cost \$6.50 including tax. If Olivia can save

## Sample Level 4/5 Mathematics Problems CONTINUED

- 25 cents every week, how many weeks would it take her to save the price of the present?  
A) 18 weeks B) 24 weeks C) 30 weeks D) 26 weeks  
E) none of these
4. If you were to add in the Roman numeral number system, then XI + XIX =  
A) XXX B) XXXX C) XX D) XXII E) none of these
5. In the following number pattern, the next number would be:  
3, 2, 5 4, 7, 6, \_\_\_\_\_  
A) 5 B) 15 C) 11 D) 10 E) none of these
6. Which numeral is located in the thousands place in 39,710.6245?  
A) 3 B) 9 C) 4 D) 5 E) none of these
7.  $25 \times 144 =$   
A) 360 B) 2500 C) 3600 D) 630 E) none of these
8. Doug made a perfectly circular pizza and cut the pizza into 24 equal slices. If Doug's best friend, Charlie, ate eight pieces, what part of the pizza is left?  
A)  $\frac{3}{4}$  B)  $\frac{2}{3}$  C)  $\frac{5}{6}$  D)  $\frac{1}{3}$  E) none of these

### Answers for Mathematics Level 4/5 sample problems:

1. C      2. D      3. D      4. A  
5. E (10)      6. B      7. C      8. B

## Sample Level 6-8 Mathematics Problems

1.  $(0.25) \times (0.333\dots) \times (0.375) \times (0.4) =$   
A. 0.125 B. 0.1 C. 0.05 D. 0.0625 E. NOT
2. Timmy has 6 boxes. The boxes are holding 14, 18, 3, 0, 7, and 30 marbles, respectively. Find the average number of marbles in each box.  
A. 14.4 B. 10.6 C. 11 D. 12 E. NOT
3.  $MMIX + MMXI =$  \_\_\_\_\_ (Arabic numerals)  
A. 4024 B. 4022 C. 4002 D. 4020 E. NOT
4. Find the distance between (4,1) and (1,5) on a coordinate plane.  
A) 5 B) 3 C) 6 D) 4 E) Not Given
5. Find the units digit of  $4^5$   
A) 0 B) 2 C) 3 D) 6 E) Not Given
6. Two peaches and one pear cost \$1.15. Three peaches and three pears cost \$2.40. What is the cost of one peach?  
A) \$.35 B) \$.45 C) \$.27 D) \$.55 E) Not Given
7. If two line segments intersect as shown, then  $a^\circ + b^\circ = ?^\circ$   
A) 80 B) 100 C) 150 D) 180 E) Not Given

### Answers for Level 6/7/8 Sample Problems:

1. ?      2. ?      3. ?      4. D  
5. A      6. E (4)      7. A

2009

MATHEMATICS

2010

### ADDITIONAL INFORMATION FOR COACHES / CONTEST DIRECTORS

• **PREPARATION FOR CONTEST.** Read and follow all instructions provided in the "Information Pertaining to All Contests" section of the *PSIA Academic Handbook*. Observe and practice with students all rules and procedures delineated in the "Instructions to the Contestant" and in the "Checklist for Contest Directors" and the "Checklist for Graders." Preparation for the MATHEMATICS Contest should include student practice in regular and advanced mathematics textbook studies, as indicated in the student information.

• **PERSONNEL NEEDED FOR CONTEST.**

*Contest Director and Assistant Director* from two different schools, each knowledgeable of contest construction and administration.

*Graders.* Director and assistant director may also serve as graders. To expedite the grading process, provide at least two graders for every 15 papers. Graders do not need to be certified in any certain field of study, but math knowledge is certainly helpful.

• **SCORING (ADDITIONAL INFORMATION).** +5 for each correct answer, and -2 for each incorrect answer, erased answer that does not have an X in the answer box, or marked through answer that does not result in a correct answer. Graders should each use a different color pen or pencil to mark papers and place their initials at the bottom of the test answer sheet to indicate that they have graded the paper. Tests ranking in the top 10 should be scored by a third individual. Post all scores on the Contest Roster before ranking.

