

# The Pennsylvania System of School Assessment



# 2006 – 2007 **Mathematics Item and Scoring Sampler** Grade 8

Pennsylvania Department of Education Bureau of Assessment and Accountability 2006–2007

# **GRADE 8 MATHEMATICS MULTIPLE-CHOICE ITEMS**

During an assessment, students would not be permitted to use a calculator on items 1–3.

# A.1.1.2

**1.** What is the square root of 64?

А	2	factor
В	8 *	
С	32	divided by 2
D	4,096	64 squared

#### A.2.1.1

**2.** Simplify:



# A.3.3.1

**3.** Solve:

С



18 27-9

D 36 \*

#### A.1.1.1

4. The population of Pennsylvania in the year 2000 was approximately 12,281,100. What is this number written in scientific notation?

А	$1.2281100 \times 10^{1}$	wrong exponent
В	$122811\times 10^2$	lead number not between 1 and 10
С	$1.22811 \times 10^7 *$	
D	$0.12281100 \times 10^{8}$	lead number not between 1 and 10

#### A.2.2.1

5. The newsstand price of a magazine is discounted 28% for subscribers. The newsstand price is \$5.00. What is the subscription price?

А	\$1.40	5 × 0.28
В	\$3.60 *	
С	\$4.72	5-0.28
D	\$5.28	5 + 0.28

### A.2.2.2

6. Hassan deposited \$7,500 into a bank account. At the end of 3 years, the account had earned \$900 in simple interest. What rate of interest did the account earn per year?

А	2.78%	approximately 7,500 ÷ 2,700; with percent sign
В	4% *	
С	8.33%	approximately 7,500 ÷ 900; with percent sign
D	12%	900 ÷ 7,500

#### B.1.1.1

D

7. The lead on Jack's pencil is 5 millimeters long. What is this length in centimeters (cm)?

А	0.05 cm	5 ÷ 100
В	0.5 cm *	
С	50 cm	5 × 10

500 cm	5 × 100

#### B.1.1.2

- Denise drinks 5 gallons of milk per month. 8. How many pints of milk does Denise drink per month?
  - А 10 pints  $5 \times 2$
  - В 20 pints  $5 \times 4$
  - 40 pints \* С
  - 80 pints D 5 × 16

#### B.2.1.1

Use the polygon below to answer question 9.



- What is the total number of degrees of the 9. interior angles of this polygon?
  - А 64°
- number of sides × 8
  - В 360° number of degrees in quadrilateral
  - С 900° number of degrees in heptagon
  - D 1,080° \*

#### **B.2.1.2**

- **10.** What is the measure of 1 interior angle of a regular quadrilateral?
  - $4^{\circ}$ А number of sides
  - В  $40^{\circ}$ based on 4
  - 90° \* С
  - D 360° total number of degrees

#### B.2.3.1

Use the figure below to answer question 11.



- **11.** What is the surface area of the figure?
  - 24 sq cm  $2 \times 3 \times 4$ А
  - В 36 sq cm  $2(2 \times 3) + 2(3 \times 4)$
  - 40 sq cm С  $2(2\times 4) + 2(3\times 4)$
  - 52 sq cm \* D

#### B.2.3.2

D

**12.** The length of a side of a cube is  $5\frac{1}{2}$  inches. What is its volume in cubic inches?



C.1.1.2

Use the diagram below to answer question 13.



- **13.** Which angles are supplementary?
  - $\angle AHD and \angle DHE *$ А
  - $\angle$ CHD and  $\angle$ DHE В
  - $\angle$ BHD and  $\angle$ DHE С adjacent
  - $\angle$ BHC and  $\angle$ FHG D



vertical

 $6(5.5^2)$ 

#### C.1.2.1

Use the shape below to answer question 14.



**14.** What is the value of *x*?



- C 7 cm *reasonable estimate*
- D 8 cm \*

C.3.1.1

Use the figure below to answer question 15.



- **15.** What is the location of point S?
  - A (-3,5) \*
  - B (3, 5) sign error
  - C (-5, 3) *location error*
  - D (5, -3) y, x reversed

#### D.1.1.2

**16.** Sid wrote a list of numbers using a rule.

8, 15, 24, 35, \_\_\_\_

Based on the rule, what should be the next number?

А	42	(15-8)+35
В	44	(24 – 15) + 35
С	46	(35 – 24) + 35
D	48 *	

# D.1.1.3

Use the table below to answer question 17.

x	y
1	-1
3	5
5	11
7	17

- **17.** The relationship of the values in the table is based on which rule?
  - A x-2 = y
  - $B \qquad x + 2 = y$
  - C 2x 1 = y
  - D 3x 4 = y \*

# D.2.1.1

18. There is \$150 in Dave's bank account. He deposits \$200 into the account each month. Dave needs at least \$700 to buy a used car. The inequality below can be solved for *x* to find the number of deposits Dave must make to reach his goal.

$$200x + 150 \ge 700$$

How many deposits must Dave make?

А	$x \ge 2.75$ *	
В	$x \le 2.75$	incorrect symbol
С	$x \ge 4.25$	added 150
D	$x \le 4.25$	added 150; symbol reversed

# D.2.1.3

Use the expression below to answer question 19.

$$5x - 12 - x$$

- **19.** What is the value of the expression when x = -2?
  - A -24 -10-12-2

#### D.2.2.1

- **20.** When Bernie earns 5 times more than the amount (*a*) of money he has plus another \$1,000, he will have at least \$16,000 to start a small business. Which statement represents this situation?
  - A  $5a + 1,000 \ge 16,000$  \*
  - B  $5 + 1,000a \le 16,000$
  - C  $5a + 1,000 \le 16,000$
  - D  $5 + 1,000a \ge 16,000$

#### D.2.2.2

- **21.** Jay is 3 years less than 4 times Nelly's age (*n*). Which expression represents Jay's age?
  - A 3-4n
  - B 3*n* 4
  - C 4*n*-3 \*
  - D 4n + 3

#### D.4.1.2

Use the graph below to answer question 22.



**22.** Which table of values matches the graphed function?

А	x	y	*
	0	-3	
	1	-1	
	2	1	
	3	3	

x	y
-3	0
-1	1
1	2
3	3

_		
С	x	y
	0	3
	1	1
	2	1
	3	-3

D

В

x	у
0	-2
1	-1
2	1
3	-3

# E.1.1.3

**23.** Raja showed the number of pages she read each night on a stem-and-leaf plot.

## Nightly Pages Read

1	2	2	
2	5		
3	8		
5	7	8	
Key			
4 6 = 46			

What is the total number of pages Raja read?

А	43	adds each digit
В	142	adds sums of tens and ones
С	202 *	

D 763 122 + 25 + 38 + 578

# E.3.1.1

24. There were 5 women, 14 men, and 21 children on a bus. One person signaled the driver to stop. What is the probability that the person who signaled was a woman?



#### E.3.2.1

**25.** Kari, Myrna, Nate, and Walt were standing in the lunch line. How many different ways could they be arranged in the lunch line?



D 24 \*

# **GRADE 8 FIRST OPEN-ENDED ITEM**

**B.2** 

- **26.** Brad and Molly decorated their classroom walls with paper polygons. Molly made a regular 6-sided polygon.
  - **A.** What is the total number of degrees in the interior angles of a regular 6-sided polygon? Show or explain all your work.

**B.** What is the measure of 1 interior angle of this same polygon? Show or explain all your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

- **26.** *Continued.* Please refer to the previous page for task explanation.
  - **C.** Brad chose another shape. It was a polygon with interior angle measures totaling 540°. Describe a polygon that Brad could have chosen. Show or explain all your work.

**D.** Brad also made a 7-sided polygon with 1 interior right angle. Explain why this shape is **not** a regular polygon.

# **GRADE 8 SECOND OPEN-ENDED ITEM**

A.2

- 27. The Carz-4-Rent company charges different rates for renting different types of vehicles.
  - **A.** To rent a car, Carz-4-Rent charges \$40.00 per day plus *x* dollars per mile driven. It cost Hector \$76.00 to rent a car for 1 day. He drove 150 miles. How much was Hector charged per mile? Show or explain all your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

**27.** *Continued.* Please refer to the previous page for task explanation.

Carz-4-Rent charges \$32.00 per day plus \$0.21 per mile to rent a truck.

**B.** Mary rented a truck for 7 days from Carz-4-Rent and drove it 750 miles. What was the total charge for Mary to rent the truck? Show or explain all your work.

**C.** Mary must pay 16% on the total charge for taxes. Use your answer from part B to find Mary's total charge, plus taxes, for renting the truck. Show or explain all your work.