

## The Pennsylvania System of School Assessment



Mathematics Item and Scoring Sampler Grade 8

## MATHEMATICS

## 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 ?
A 2
factor
B 8 *
C 32
divided by 2
D 4,096
64 squared

## A.3.3.1

3. Solve:

$$
27--9
$$

A -3
$27 \div-9$
B $\quad-18$
$-27+9$
C 18
27-9

D 36 *

## A.2.1.1

2. Simplify:

$$
2^{3}+6 \div 3-(-10 \div 2)
$$

A 0
$(8+2-10) \div 2$
B 3 $6+6 \div 3-5$

C 13
$6+2+5$
D 15 *

## MATHEMATICS

## 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?
A $1.2281100 \times 10^{1}$
wrong exponent
B $122811 \times 10^{2}$
C $1.22811 \times 10^{7}$ *
D $\quad 0.12281100 \times 10^{8}$
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?
A $\quad \$ 1.40$
$5 \times 0.28$
B $\$ 3.60$ *
C $\quad \$ 4.72$

$$
5-0.28
$$

D $\quad \$ 5.28$

$$
5+0.28
$$

## 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?
A $2.78 \%$ approximately $7,500 \div 2,700$;
with percent sign
B $4 \%$ *
C $8.33 \%$ approximately $7,500 \div 900$;
with percent sign with percent sign
D $12 \%$

$$
900 \div 7,500
$$

## B.1.1.1

7. The lead on Jack's pencil is 5 millimeters long. What is this length in centimeters (cm)?
A $\quad 0.05 \mathrm{~cm}$
$5 \div 100$
B $\quad 0.5 \mathrm{~cm}$ *
C $\quad 50 \mathrm{~cm}$
$5 \times 10$
D $\quad 500 \mathrm{~cm}$
$5 \times 100$

## MATHEMATICS

## B.1.1.2

8. Denise drinks 5 gallons of milk per month. How many pints of milk does Denise drink per month?
A $\quad 10$ pints
$5 \times 2$
B $\quad 20$ pints

$$
5 \times 4
$$

C 40 pints *
D 80 pints $\square$

## B.2.1.1

## Use the polygon below to answer question 9.


9. What is the total number of degrees of the interior angles of this polygon?

A $64^{\circ}$ number of sides $\times 8$
B $360^{\circ} \quad$ number of degrees in quadrilateral
C $900^{\circ}$ number of degrees in heptagon
D $1,080^{\circ}$ *

## B.2.1.2

10. What is the measure of 1 interior angle of a regular quadrilateral?

A $4^{\circ}$ number of sides
B $40^{\circ}$ based on 4
C $90^{\circ} *$
D $360^{\circ}$ 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?
A $24 \mathrm{sq} \mathrm{cm} \quad 2 \times 3 \times 4$
B $36 \mathrm{sq} \mathrm{cm} \quad 2(2 \times 3)+2(3 \times 4)$
C $40 \mathrm{sq} \mathrm{cm} \quad 2(2 \times 4)+2(3 \times 4)$
D $\quad 52 \mathrm{sq} \mathrm{cm} *$

## MATHEMATICS

## B.2.3.2

12. The length of a side of a cube is $5 \frac{1}{2}$ inches. What is its volume in cubic inches?
A $\quad 22 \mathrm{in} .^{3}$
4(5.5)
B $\quad 30.25$ in. $^{3}$
$5.5^{2}$
C $166.375 \mathrm{in} .^{3}$ *
D 181.5 in. $^{3}$
$6\left(5.5^{2}\right)$

## C.1.1.2

Use the diagram below to answer question 13.

13. Which angles are supplementary?

A $\angle \mathrm{AHD}$ and $\angle \mathrm{DHE} *$
B $\angle \mathrm{CHD}$ and $\angle \mathrm{DHE}$ complementary
C $\angle \mathrm{BHD}$ and $\angle \mathrm{DHE}$ adjacent
D $\angle \mathrm{BHC}$ and $\angle \mathrm{FHG}$ vertical

## MATHEMATICS

## C.1.2.1

Use the shape below to answer question 14.

14. What is the value of $x$ ?

A $4 \mathrm{~cm} 10-6$
B 6 cm congruent to other leg
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 $(-5,3) \quad$ location error
D $(5,-3) \quad y, x$ reversed

## MATHEMATICS

## 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?

A $42 \quad(15-8)+35$
B 44

$$
(24-15)+35
$$

C 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 $x+2=y$
C $2 x-1=y$
D $3 x-4=y$ *

## 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.

$$
200 x+150 \geq 700
$$

How many deposits must Dave make?
A $x \geq 2.75$ *
B $x \leq 2.75$ incorrect symbol
C $x \geq 4.25$
added 150
D $x \leq 4.25$
added 150; symbol reversed

## D.2.1.3

Use the expression below to answer question 19.

$$
5 x-12-x
$$

19. What is the value of the expression when $x=-2$ ?
A $\quad-24$
$-10-12-2$
B -20 *
C $-4 \quad 10-12-2$
D $0 \quad 10-12+2$

## MATHEMATICS

## 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 $5 a+1,000 \geq 16,000$ *
B $5+1,000 a \leq 16,000$
C $5 a+1,000 \leq 16,000$
D $5+1,000 a \geq 16,000$

## D.2.2.2

21. Jay is 3 years less than 4 times Nelly's age (n). Which expression represents Jay's age?

A $3-4 n$
B $3 n-4$
C $4 n-3$ *
D $4 n+3$

## MATHEMATICS

## D.4.1.2

Use the graph below to answer question 22.

22. Which table of values matches the graphed function?

A | $x$ | $y$ |
| ---: | ---: |
| 0 | -3 |
| 1 | -1 |
| 2 | 1 |
| 3 | 3 |

B

| $x$ | $y$ |
| ---: | ---: |
| -3 | 0 |
| -1 | 1 |
| 1 | 2 |
| 3 | 3 |

C

| $x$ | $y$ |
| ---: | ---: |
| 0 | 3 |
| 1 | 1 |
| 2 | 1 |
| 3 | -3 |

D

| $x$ | $y$ |
| :---: | :---: |
| 0 | -2 |
| 1 | -1 |
| 2 | 1 |
| 3 | -3 |

## MATHEMATICS

## 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 |
| :---: |
| $4 \mid 6=46$ |

What is the total number of pages Raja read?
$\begin{array}{lrl}\text { A } & 43 & \text { adds each digit } \\ \text { B } & 142 & \text { adds sums of tens and ones } \\ \text { C } & 202 * \\ \text { D } & 763 & 122+25+38+578\end{array}$

## 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?


## MATHEMATICS

## 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.

## MATHEMATICS

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 $540^{\circ}$. 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.

## MATHEMATICS

## 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.

## MATHEMATICS

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.

