

# The Pennsylvania System of School Assessment 

## Mathematics Item and Scoring Sampler



2007-2008
Grade 8

## MATHEMATICS

## MULTIPLE-CHOICE ITEMS

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

## A.2.1.1

1. Simplify: $8 \cdot 3^{2}+7 \bullet(6-4)$

A $62 \quad 3^{2}=6$
B 86 *
C 110
$(8 \times 9)+(7 \bullet 6)-4$
D 590
$(8 \times 3)^{2}$

## A.3.2.1

2. Jim earned $\$ 127.59$ last month. He spent about $20 \%$ of the money. Which is the closest estimate of the amount of money Jim spent?

A $\$ 13 \quad 10 \%$ of $\$ 130$
B $\$ 20 \quad 20 \%$ of $\$ 100$
C \$26 *
D $\$ 30 \quad 20 \%$ of $\$ 150$

## A.3.3.1

3. Multiply:

|  |  | $41.6 \times 3$ |
| :--- | :--- | :--- |
| A | 12.48 | incorrect decimal point <br> placement |
| B | 123.18 | $0.6 \times 3=0.18$ with no regroup |
| C | 124.8 | $*$ |
| D | 1231.8 | $0.6 \times 3=1.8$ with no regroup |

D $1231.8 \quad 0.6 \times 3=1.8$ with no regroup

## MATHEMATICS

## A.1.1.1

4. Which is $5,291,000$ written in scientific notation?

A $5.291 \times 10^{3}$
exponent equals number of zeros
B $\quad 529.1 \times 10^{4}$
incorrect placement of decimal point
C $52.91 \times 10^{5}$
incorrect placement of decimal point
D $5.291 \times 10^{6}$
*

## A.3.1.1

5. Lisa needs 56 envelopes. She buys the envelopes in packages of 12 . What is the minimum number of packages Lisa should buy to get 56 envelopes?

A 356 rounded to 60 and 12 to $20 ; 60 \div 20$
B $456 \div 12$; rounded
C 5 *
D 6 56 rounded to 60 and 12 to 10; 60 $\div 10$

## A.3.1.2

6. Mara has $\$ 100$. She wants to buy 3 pieces of luggage priced as shown below.

- suitcase $\$ 39.95$
- carry-on bag \$24.95
- tote bag \$16.95

When is an estimate appropriate?
A when Mara is deciding if $\$ 100$ is enough to buy all 3 pieces

B when the salesperson is scanning the cost of each piece
exact amount
C when Mara is told how much money is due
exact amount
D when the salesperson is counting out Mara's change
exact amount

## MATHEMATICS

## B.1.1.3

7. Danny babysat for 5 hours yesterday. For how many seconds did Danny babysit yesterday?
A 300
minutes, $5 \times 60$
B 3,600
seconds in 1 hour, $60 \times 60$
C 7,200
minutes in 5 days, $5 \times 24 \times 60$
D 18,000 *

## B.1.1.4

8. The thermometer in Molly's backyard read $21^{\circ} \mathrm{F}$. What was the approximate temperature in degrees Celsius?

A $-20.3^{\circ} \mathrm{C} \quad(5 / 9)(21)-32$
B $\quad-6.1^{\circ} \mathrm{C} \quad$ *
C $\quad 11.6^{\circ} \mathrm{C} \quad(5 / 9)(21)$
D $\quad 69.8^{\circ} \mathrm{C} \quad(9 / 5) 21+32$

## MATHEMATICS

## C.1.1.1

10. A cone is shown below.


Which is a net for the cone?
A

B

C

D


## MATHEMATICS

## C.1.1.2

11. Angles $J$ and $K$ are vertical angles. The measure of angle J is $46^{\circ}$. What is the measure of angle K ?

A $44^{\circ}$ complement
B $46^{\circ}$ *
C $134^{\circ}$ supplement
D $136^{\circ} \quad 46^{\circ}+90^{\circ}$

## C.1.1.3

12. In the diagram below, line $l$ is parallel to line $m$ and line $p$ is parallel to line $q$.


Which angle has the same measure as $\angle 1$ ?

A $\angle 2 \quad$ supplement
B $\angle 3$ *
C $\angle 4$
supplement
D $\angle 5$
supplement

## MATHEMATICS

## C.3.1.1

Use the graph below to answer question 13.

13. At what point does the line intersect the $y$-axis?

A $(-3,0) \quad$ reverse order
B $(0,-3) \quad$ *
C $(0,5) \quad$ reverse order of $x$-intercept
D $(5,0)$
$x$-intercept

## D.1.1.1

14. Fiona created a pattern using numbers as shown below.

$$
0,2,6,12
$$

The pattern continues. What is the next number in the pattern?
A 14
$0+2=2 ; 12+2=14$
B 18

$$
6+6=12 ; 12+6=18
$$

C 20
D 24
$6 \times 2=12 ; 12 \times 2=24$

## D.1.1.2

15. At 3:00 P.M. the temperature in Pittsburgh was $93^{\circ} \mathrm{F}$. The temperature decreased at a rate of $2^{\circ} \mathrm{F}$ every 30 minutes. What was the temperature at 7:30 P.M.?

A $75^{\circ} \mathrm{F}$ *
B $\quad 77^{\circ} \mathrm{F} \quad 93-(2 \times 8)$
C $84^{\circ} \mathrm{F} \quad 93-(2 \times 4.5)$
D $111^{\circ} \mathrm{F} \quad 93+(2 \times 9)$

## MATHEMATICS

## D.2.1.1

16. Dora owns a card store. After a full week, she made $\$ 250.00$ by selling cards (c). Using the equation
$1.25 c=250$, how many cards did Dora sell that week?
A 125
250-125
B 200

* 

C 251
$250+1$
D 312
$250 \times 1.25$

## D.2.1.2

17. In which equation is $m=28$ the solution?

A $\frac{m}{5}-3=5 \quad m=40$
B $m-\frac{3}{5}=5 \quad m=5 \frac{3}{5}$
C $\frac{m-3}{5}=5 \quad$ *
D $(m-3) 5=5 \quad m=4$

## D.2.2.1

18. Which expression represents 4 times the sum of $x$ squared and 6 ?

A $4 x^{2}+6 \quad 4$ distributed to first term only
B $4\left(x^{2}+6\right) \quad *$
C $4(x+6)^{2} \quad$ quantity squared
D $(4 x+6)^{2} \quad$ entire expression squared

## MATHEMATICS

## D.4.1.1

## Use the table below to answer question 19.

| $x$ | $y$ |
| :---: | :---: |
| 3 | 11 |
| 6 | 17 |
| 9 | 23 |
| 12 | 29 |

19. Which graph shows the relationship?


## MATHEMATICS

## D.4.1.3

20. The table below shows a relationship between the values of $x$ and $y$.

| $x$ | $y$ |
| ---: | ---: |
| -5 | -9 |
| -2 | -6 |
| 1 | -3 |
| 2 | -2 |
| 4 | 0 |

Which equation describes the relationship?
A $y=-2 x-1 \quad x=1 ; y=-3$ (3rd row)
B $y=-x+4 \quad x=4 ; y=0$ (5th row)
C $y=x-4$ *
D $y=2 x-5 \quad x=1 ; y=-3$ (3rd row)

## E.1.1.1

21. A student surveyed his classmates about their favorite choice for a field trip. The results of the survey are shown below.

$$
\begin{aligned}
& 21 \% \text { art gallery } \\
& 15 \% \text { museum } \\
& 16 \% \text { theater } \\
& 48 \% \text { zoo }
\end{aligned}
$$

Which of these displays would best represent the data?

A line graph
B circle graph
2 variables

C frequency table
tally list
D box-and-whiskers plot

## MATHEMATICS

## E.1.1.2

22. The graph below shows the frequency of days that were sunny, cloudy, rainy, and snowy in February of 2005.

February 2005


Which statement about the data is true?
A It was sunny the same number of days as it was rainy.

```
sunny section larger than rainy
```

B It was snowy the same number of days as it was rainy.

C It was sunny more days than it was cloudy.
cloudy section larger than sunny
D It was snowy more days than it was sunny.
sunny section larger than snowy

## E.3.2.1

23. Matt has three pairs of shorts, five shirts, and two pairs of shoes. How many different outfits consisting of one shirt, one pair of shorts, and one pair of shoes can he make?
A 5
number of shirts
B 10
$3+5+2$
C 25
$5 \times(3+2)$
D 30 *

## MATHEMATICS

## E.4.1.1

Use the scatterplot below to answer question 24.

24. Which type of correlation is represented by the scatterplot?

A strong positive
*
B strong negative
opposite direction
C weak positive
incorrect relation of points
D weak negative
opposite direction; incorrect relation

## E.4.1.2

25. A random survey shows that 14 out of 21 students plan to vote for Jacob for class president. Which is the best prediction of the total number of votes Jacob will receive if 180 students vote?
A 35
$14+21$
B 90
$180 \div 2$
C 120

* 

D 173
180-(21-14)

## MATHEMATICS

## FIRST OPEN-ENDED ITEM

D. 2
26. Some students held a car wash. They charged $\$ 3$ to wash each car. The students made a profit of $\$ 181$ after they spent $\$ 11$ on supplies for the car wash.
A. How many cars did they wash? Show all your work. Explain why you did each step.

## MATHEMATICS

26. Continued. Please refer to the previous page for task explanation.
B. What is the least number of cars the students must wash to have a profit of $\$ 330$ after spending a total of $\$ 15$ on supplies? Show all your work. Explain why you did each step.

## MATHEMATICS

## SECOND OPEN-ENDED ITEM

## A. 2

27. Train $L$ and train $M$ leave a station at the same time heading in opposite directions. Train $L$ is going north at an average speed of 75 miles per hour (mph). Train M is going south at an average speed of 60 mph .
A. How long does it take each train, in hours, to travel 225 miles along the track? Show all your work. Explain why you did each step.

## MATHEMATICS

27. Continued. Please refer to the previous page for task explanation.
B. What is the distance, in miles, between the two trains after each train travels for 6 hours? Show all your work. Explain why you did each step.
