

The Pennsylvania System of School Assessment

Mathematics Item and Scoring Sampler



2007–2008 Grade 8

Pennsylvania Department of Education Bureau of Assessment and Accountability 2007–2008

MULTIPLE-CHOICE ITEMS

| | During an assessment, students would not be permitted to use a calculator on items 1–3. | | | | | | |
|---------|---|-----------|--------------------------------------|----|--------|--------------------------------------|---------------------------------------|
| A.2.1.1 | | A.3 | 8.3.1 | | | | |
| 1. | Sim | nplify: 8 | $3 \bullet 3^2 + 7 \bullet (6 - 4)$ | 3. | Мı | ıltiply: | |
| | А | 62 | $3^2 = 6$ | | | | 41.6 × 3 |
| | B C | 86 110 | * $(8 \times 9) + (7 \bullet 6) - 4$ | | А | 12.48 | incorrect decimal point placement |
| | D | 590 | $(8\times3)^2$ | | В | 123.18 | $0.6 \times 3 = 0.18$ with no regroup |
| | | | | | С | 124.8 | * |
| A.3.2.1 | | | | D | 1231.8 | $0.6 \times 3 = 1.8$ with no regroup | |
| 2. | Jim | earned | \$127.59 last month. He | | | | |

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?

| А | \$13 | 10% of \$130 |
|---|------|--------------|
| В | \$20 | 20% of \$100 |
| С | \$26 | * |
| D | \$30 | 20% of \$150 |

A.1.1.1

- **4.** Which is 5,291,000 written in scientific notation?
 - A 5.291×10^3 exponent equals number of zeros
 - B 529.1 \times 10⁴ *incorrect placement of decimal point*
 - C 52.91×10^{5} *incorrect placement of decimal point* D 5.291×10^{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 3 56 rounded to 60 and 12 to 20; 60 ÷ 20
 - B 4 $56 \div 12$; rounded

*

- C 5 *
- D 6 56 rounded to 60 and 12 to 10; 60 ÷ 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

B.1.1.3

7. Danny babysat for 5 hours yesterday. For how many seconds did Danny babysit yesterday?

| А | 300 | minutes, 5×60 |
|---|-------|--|
| В | 3,600 | seconds in 1 hour, 60 × 60 |
| С | 7,200 | <i>minutes in 5 days, $5 \times 24 \times 60$</i> |

D 18,000

B.1.1.4

8. The thermometer in Molly's backyard read 21°F. What was the approximate temperature in degrees Celsius?

*



B.2.1.3

9. The sum of the measures of the interior angles of a polygon is 900°. Exactly how many sides does the polygon have?

| А | 3 | 900 ÷ 180 – 2 |
|---|---|---------------|
| В | 5 | 900 ÷ 180 |

- C 7 *
- D 10 $900 \div 180 \times 2$

C.1.1.1

10. A cone is shown below.



Which is a net for the cone?









C.1.1.2

11. Angles J and K are vertical angles. The measure of angle J is 46°. What is the measure of angle K?

| А | 44° | complement |
|---|--------------|---------------------------|
| В | 46° | * |
| С | 134° | supplement |
| D | 136° | $46^{\circ} + 90^{\circ}$ |

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 $\angle 2$ supplementB $\angle 3$ *C $\angle 4$ supplement
- D $\angle 5$ supplement

C.3.1.1





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

| А | (-3, 0) | reverse order |
|---|---------|---------------|
| В | (0,-3) | * |

- C (0, 5) *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?

| А | 14 | 0 + 2 = 2; 12 + 2 = 14 |
|---|----|-------------------------|
| В | 18 | 6 + 6 = 12; 12 + 6 = 18 |
| С | 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°F. The temperature decreased at a rate of 2°F every 30 minutes. What was the temperature at 7:30 P.M.?
 - A 75°F *
 - B $77^{\circ}F$ $93 (2 \times 8)$
 - C $84^{\circ}F$ $93 (2 \times 4.5)$
 - D $111^{\circ}F$ $93 + (2 \times 9)$

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?

| А | 125 | 250 - 125 |
|---|-----|------------|
| В | 200 | * |
| С | 251 | 250 + 1 |
| D | 312 | 250 × 1.25 |

D.2.1.2

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

| А | $\frac{m}{5} - 3 = 5$ | <i>m</i> = 40 |
|---|-----------------------|--------------------|
| В | $m - \frac{3}{5} = 5$ | $m = 5\frac{3}{5}$ |
| С | $\frac{m-3}{5} = 5$ | * |
| D | (m-3)5 = 5 | <i>m</i> = 4 |

D.2.2.1

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

| А | $4x^2 + 6$ | 4 distributed to first term only |
|---|--------------|----------------------------------|
| В | $4(x^2 + 6)$ | * |
| С | $4(x+6)^2$ | quantity squared |
| D | $(4x+6)^2$ | entire expression squared |

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?



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?

| А | y = -2x - 1 | x = 1; y = -3 (3rd row) |
|---|-------------|-------------------------|
| В | y = -x + 4 | x = 4; y = 0 (5th row) |
| С | y = x - 4 | * |
| D | y = 2x - 5 | 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.
 - 21% art gallery15% museum16% theater48% zoo

Which of these displays would **best** represent the data?

| А | line graph | 2 variables |
|---|-----------------------|-------------|
| В | circle graph | * |
| С | frequency table | tally list |
| D | box-and-whiskers plot | data list |

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.

cloudy

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 *

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 ÷ 2*
 - C 120 *
 - D 173 *180 (21 14)*

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.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

- **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.

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.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

- **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.