The Pennsylvania System of School Assessment
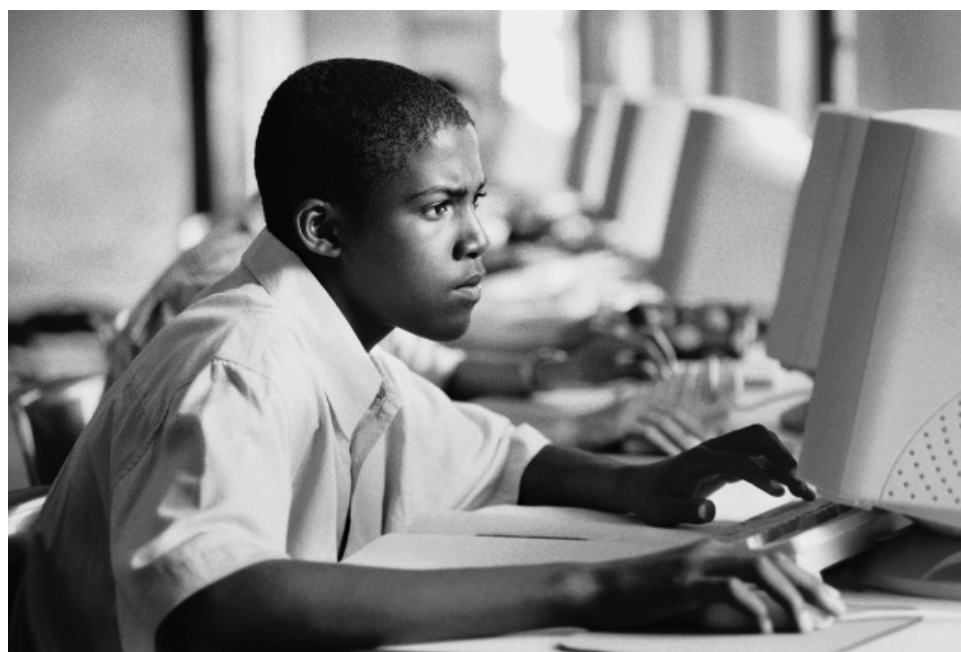
Mathematics
Item and Scoring Sampler

2007–2008
Grade 7

MATHEMATICS

MULTIPLE-CHOICE ITEMS

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

A.1.1.1

1. Jordan answered 80% of the questions on a test correctly. What fraction of the questions did Jordan answer correctly?

   A $\dfrac{1}{80}$ | *80 as denominator* |

   B $\dfrac{2}{25}$ | *8/100 = 2/25* |

   C $\dfrac{3}{4}$ | $\frac{3}{4}$ *= 75%; rounded up* |

   D $\dfrac{4}{5}$ *

A.3.1.1

2. Which is the closest estimate of 447.777 ÷ 45.23?

   A 10   *

   B 40 | *445 – 45; decimal point moved left* |

   C 45 | *close to 45.23, 47.77* |

   D 100 | *decimal point moved right* |

A.3.2.1

3. Multiply: 40.32 • 5

   A 20.16 | *decimal point 1 place to left* |

   B 21.6 | *zero in tens place dropped* |

   C 200.6 | *1 in ones place dropped* |

   D 201.6   *

MATHEMATICS

A.1.2.1

Use the numbers below to answer question 4.

$$4.3 \quad 4\frac{1}{2} \quad 4\frac{1}{3} \quad 4.45 \quad 4\frac{2}{5}$$

4. What is the order of the numbers from **least** to **greatest**?

A $\quad 4\frac{1}{2} \quad 4\frac{1}{3} \quad 4\frac{2}{5} \quad 4.3 \quad 4.45$

> *mixed numbers ordered by denominators, then decimals*

B $\quad 4.3 \quad 4.45 \quad 4\frac{1}{2} \quad 4\frac{1}{3} \quad 4\frac{2}{5}$

> *decimals ordered, then mixed numbers ordered by denominators*

C $\quad 4\frac{1}{2} \quad 4.3 \quad 4\frac{1}{3} \quad 4.45 \quad 4\frac{2}{5}$

> *ordered by denominator and decimal values*

D $\quad 4.3 \quad 4\frac{1}{3} \quad 4\frac{2}{5} \quad 4.45 \quad 4\frac{1}{2}$

> *

A.1.2.2

5. Point M is graphed on the number line below.

What is the location of point M?

A $\quad \frac{2}{3}$ | *point M between 2 and 3*

B $\quad 1\frac{5}{9}$ | *point M on the 5th of 9 tick marks after 1*

C $\quad 2\frac{2}{3}$ | *

D $\quad 3\frac{1}{3}$ | *point M $\frac{1}{3}$ from 3*

A.2.2.4

6. Michael bought a 4-pound package of ground beef for $11.56. What is the cost per pound of the ground beef?
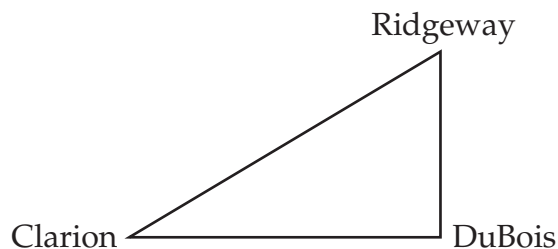
A $\quad \$ \ 0.35$ | *4 ÷ 11.56, rounded*

B $\quad \$ \ 2.89$ | *

C $\quad \$ \ 7.56$ | *11.56 − 4*

D $\quad \$46.24$ | *11.56 × 4*

MATHEMATICS

A.2.2.6

Use the map below to answer question 7.

Ridgeway

Clarion   DuBois

7. The distance from Clarion to DuBois is $2\frac{1}{2}$ inches on the map. The actual distance is 40 miles. The distance from Dubois to Ridgeway is $1\frac{1}{2}$ inches on the map. What is the actual distance, in miles, from DuBois to Ridgeway?

A $10\frac{2}{3}$ $40 \div \left(2\frac{1}{2} \times 1\frac{1}{2}\right)$

B   24   *

C   60 $40 \times 1\frac{1}{2}$

D $66\frac{2}{3}$ $40 \times \left(2\frac{1}{2} \div 1\frac{1}{2}\right)$
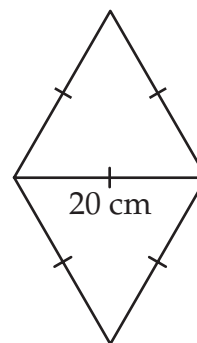
B.1.1.1

8. Doreen had 15 **yards** (yd) of string. She used 11 **feet** (ft) of string to tie some boxes together. What is the total length of string that Doreen has left?

A   14 yd 1 ft   *1 yard regrouped as 12 feet*

B   11 yd 1 ft   *

C   9 yd 1 ft   *6 yards regrouped as 12 feet*

D   4 yd   *15yd – 11yd*

B.2.1.1

9. The figure below shows two equilateral triangles that share one side.

20 cm

What is the perimeter of the figure?

A   60 cm   *20 × 3*

B   80 cm   *

C   100 cm   *20 × 5*

D   120 cm   *20 × 6*

MATHEMATICS

B.2.1.2

10. The radius of a circle is 8 centimeters (cm). What is the approximate circumference of the circle? (Use $\pi = 3.14$.)

A   16 cm | 8×2 |

B   25 cm | 8×3.14 rounded |

C   50 cm   *
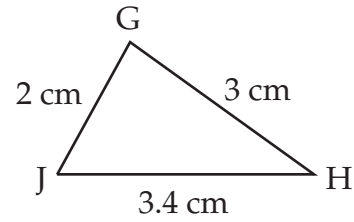
D   201 cm | $8^2 \times 3.14$ rounded |

C.1.1.2

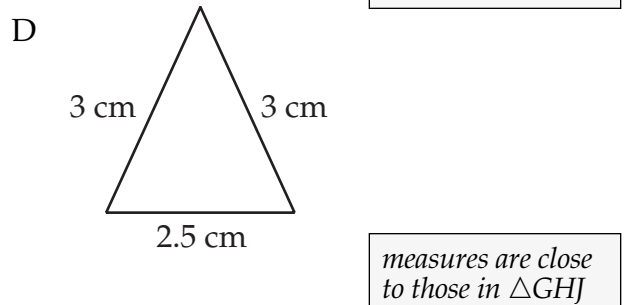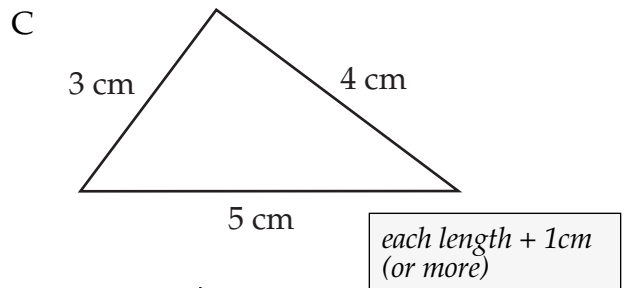**11.** The diameter of a circular plate is 11.5 inches. What is the radius of the plate in inches?
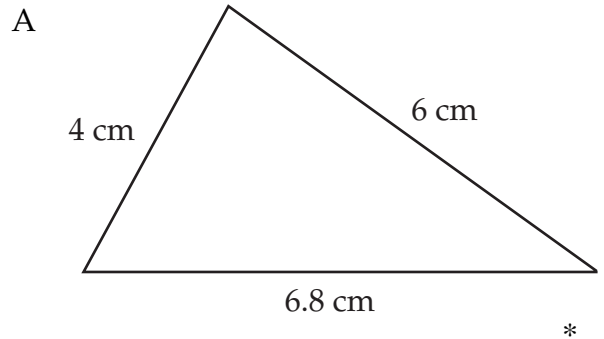
A   5.75   *

B   11.5 | *diameter* |

C   23 | 11.5×2 |

D   34.5 | 11.5×3 (estimate of π) |

C.1.2.1

Use the triangle below to answer question 12.

12. Which triangle is similar to triangle GHJ?

A

*

B

| *each length + 2cm* |

C

| *each length + 1cm (or more)* |

D

| *measures are close to those in △GHJ* |
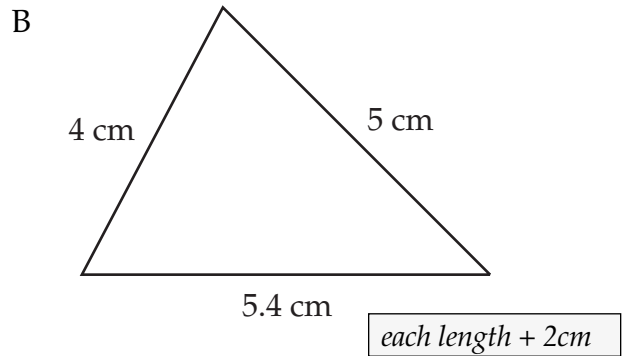
MATHEMATICS

C.1.2.2

13. Quadrilateral EFGH is similar to quadrilateral WXYZ, as shown below.
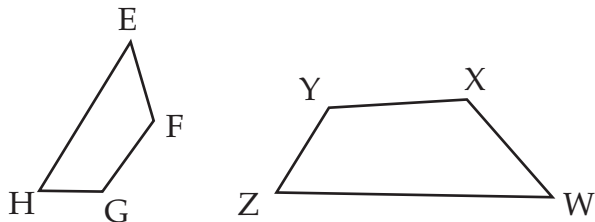
Which segment corresponds to $\overline{FG}$?

A $\overline{WX}$ *corresponds to $\overline{EF}$*

B $\overline{WZ}$ *corresponds to $\overline{EH}$*

C $\overline{YZ}$ *corresponds to $\overline{GH}$*

D $\overline{XY}$ *

C.3.1.1

14. Four points are graphed on the coordinate grid below.
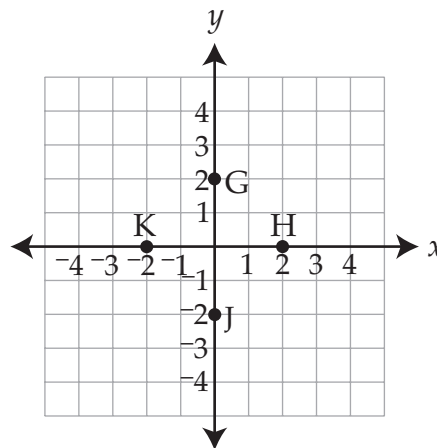
Which point represents the ordered pair (0, 2)?

A point G   *

B point H   *(2, 0)*

C point J   *(0, ⁻2)*

D point K   *(⁻2, 0)*

MATHEMATICS

D.1.1.1

15. Students give 6 speeches. The lengths of the first four speeches are shown in the table below.

Length of Speeches

Speech	1	2	3	4
Length of Speech (in minutes)	$2\frac{1}{2}$	5	$7\frac{1}{2}$	10

The length of each speech continues to increase by the same amount. What is the length of the **6th** speech?

A $2\frac{1}{2}$ minutes | *rate of increase* |

B   12 minutes | *10 + 2* |

C $12\frac{1}{2}$ minutes | *10 + 2$\frac{1}{2}$ (5th speech)* |

D   15 minutes   *

D.2.1.1

16. Dave uses the equation $15m = 165$ to calculate the amount of money (m) he earned during each hour of work. Which step should Dave use to solve the equation for m?

A   add 15 to both sides

B   subtract 15 from both sides

C   multiply both sides by 15

D   divide both sides by 15   *

MATHEMATICS

D.2.1.2

17. The formula below is used to convert Fahrenheit (°F) temperatures to Celsius.

$$°C = 10(°F − 32) ÷ 18$$

The temperature outside is 41°F. What is this temperature in degrees Celsius (°C)?

A   5   *

B   21 | *(10 × 41 − 32) ÷ 18* |

C   50 | *decimal point error* |

D   56 | *(1041 − 32) ÷ 18, rounded* |

D.2.2.1

18. The amount of money Margaret has is twice the amount Emily has plus $5. The amount of money Emily has is *e*. Which expression describes Margaret's amount of money?

A $\dfrac{e}{2} − 5$

B $\dfrac{e}{2} + 5$
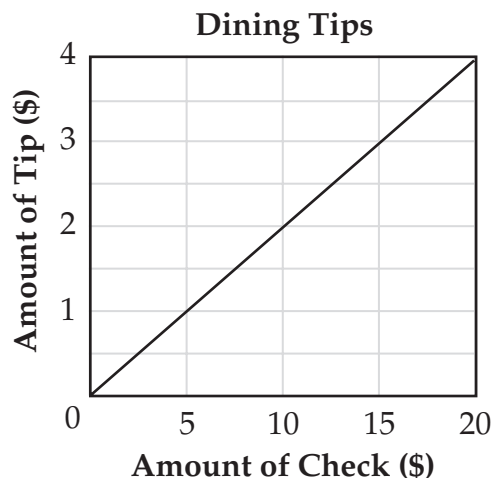
C $2e − 5$

D $2e + 5$ *

MATHEMATICS

D.3.1.1

19. A radio station plays 15 songs each hour. At this rate, how many hours will it take the radio station to play 75 songs?

A　　5　*

B　　60　$\boxed{75 - 15}$

C　　90　$\boxed{75 + 15}$

D　1,125　$\boxed{75 \times 15}$

D.3.1.2

Use the line graph below to answer question 20.

Dining Tips

20. Jacob went out to eat at many restaurants. He graphed the total cost of each meal and the amount of money he gave for a tip. Which describes the rate at which the amount of the tip changed?

A　It increased $1 for every $1 increase in the amount of the check.

　$\boxed{\textit{interval change on x-axis as 1}}$

B　It increased $4 for every $1 increase in the amount of the check.

　$\boxed{\textit{greatest y value}}$

C　It increased $1 for every $5 increase in the amount of the check.
　*

D　It increased $5 for every $1 increase in the amount of the check.

　$\boxed{\textit{reversed variables}}$

MATHEMATICS

E.2.1.1

21. The monthly rents for 10 units of an apartment building are shown in the table below.

Monthly Rents

Apartment Number	Rent ($)
1	650
2	750
3	750
4	750
5	750
6	875
7	900
8	925
9	925
10	2,900

What is the mode of the rents at the apartment building?

A   750.00   *

B   812.50   *median*

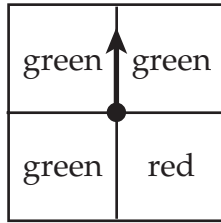C   1017.50   *mean*

D   2250.00   *range*

E.3.1.1

22. A bowl contains 13 cards numbered 1 to 13. Josh randomly selects 1 card from the bowl. What is the probability the card has an even number on it?

A $\frac{6}{13}$ *

B $\frac{1}{2}$ *$\frac{1}{2}$ even, $\frac{1}{2}$ odd*

C $\frac{7}{13}$ *probability odd*

D $\frac{6}{7}$ *even to odd*

MATHEMATICS

E.3.1.2

Use the spinner below to answer question 23.

23. The arrow on the spinner is spun once. What is the probability the arrow on the spinner does **not** stop on green?
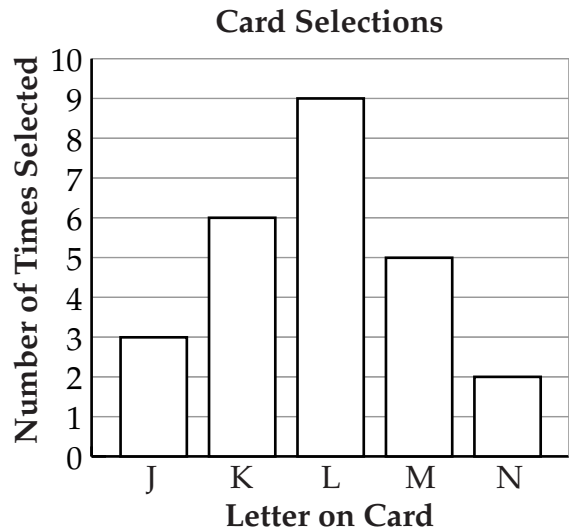
A $\frac{1}{4}$ *

B $\frac{1}{3}$ | *1 red and 3 green* |

C $\frac{2}{3}$ | *opposite of option B* |

D $\frac{3}{4}$ | *probability of green* |

E.3.1.3

24. A box contains 5 cards, lettered J through N. A card is randomly selected from the box. The letter on the card is recorded and the card is returned to the box. The bar graph below shows the number of times each card was selected during an experiment.

Card Selections

Based on the bar graph, what is the **experimental** probability of selecting a card with the letter M on it?

A $\frac{2}{25}$ | *probability of selecting N* |
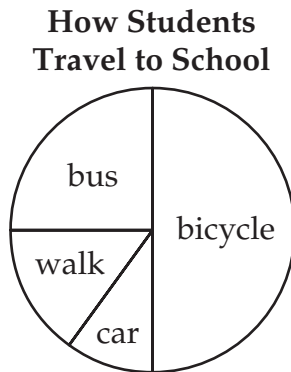
B $\frac{1}{5}$ *

C $\frac{1}{4}$ | *total M's over total of other letters (reduced)* |

D $\frac{4}{5}$ | *probability of not selecting M* |

MATHEMATICS

E.4.1.1

25. The circle graph below shows how the students at Lakeland Middle School travel to school.

**How Students
Travel to School**

There are 500 students who attend Lakeland Middle School. Based on the circle graph, how many of those students travel to school by bicycle?

A   50 students

> *50% of graph = 50 students*

B   125 students

> *1 out of 4 options = 25%;*
> *0.25 × 500*

C   250 students

> *

D   450 students

> *500 – 50*

MATHEMATICS

FIRST OPEN-ENDED ITEM

A.3

26. A total of 8,000 runners started a long distance race. The results of the race are listed below.

- $\frac{3}{16}$ of the runners finished the race in less than 4 hours.

- 0.65 of the runners finished the race in 4 or more hours.

- The rest of the runners did **not** finish the race.

A. Calculate the number of runners who finished the race in less than 4 hours. Show all your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

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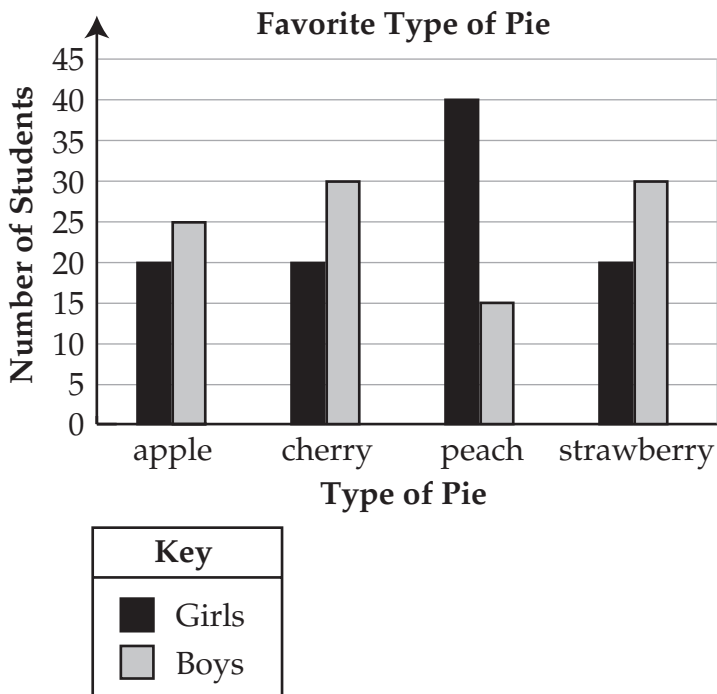

B. Calculate the number of runners who did **not** finish the race. Show all your work. Explain why you did each step.

MATHEMATICS

SECOND OPEN-ENDED ITEM

E.1

27. Mr. Oakley's class surveyed 200 students about their favorite type of pie. The double bar graph below shows the results of the survey.

Favorite Type of Pie

A. What is the difference in the total number of students who chose **peach** pie as their favorite type of pie and the total number of students who chose **apple** pie? 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 fraction of the **boys** surveyed chose **cherry** pie as their favorite type of pie? Show all your work. Explain why you did each step.