

Mathematics Test Book 1



March 12–16, 2007

Which figure below shows a reflection?

1



2 Anneke and her parents had dinner at their favorite restaurant. The dinner bill was \$50.00, and her parents tipped their server 20% of the bill. How much money did Anneke's parents leave as a tip?

- **A** \$1.00
- **B** \$10.00
- **C** \$20.00
- **D** \$25.00

3 Simplify the expression below.

12xy - 15x + 6xy **A** -9xy **B** 3xy **C** 18xy - 15x**D** 6xy - 15x

4 In the figure below, $\angle R$ and $\angle S$ are formed by two intersecting lines.



If $\angle R$ measures 55°, what is the measure of $\angle S$?

- **A** 35°
- **B** 55°
- **C** 110°
- **D** 125°

$$\frac{x+3}{2} = 8$$
A 1
B 5
C 13
D 19

6

What is the length, in centimeters, of side x in the right triangle below?



- **A** 8
- **B** 12
- **C** 15
- **D** 21

- 7 The scale of a map is $\frac{1}{4}$ inch = 12 miles. The distance between two cities on the map is $3\frac{1}{4}$ inches. What is the actual distance, in miles, between the two cities?
 - **A** 37
 - **B** 39
 - **C** 144
 - **D** 156

8 Sarah earned a 4% commission on all of her sales in March. Her total sales were \$80,000 in March. How much money did she earn from commissions?

- **A** \$320
- **B** \$3,200
- **C** \$32,000
- **D** \$320,000



Which term expresses the relationship between $\angle 1$ and $\angle 8$?

A adjacent

9

- **B** congruent
- **C** supplementary
- **D** complementary

- **10** What is the product of $(6a^2b^3c^4)$ and $(3a^3b^4c)$?
 - **A** $9a^5b^7c^4$
 - **B** $9a^5b^7c^5$
 - **C** $18a^5b^7c^5$
 - **D** $18a^5b^7c^4$

11

What is the sum of $(3 + 3)^2$ and 2^3 ?

- **A** 18
- **B** 20
- **C** 26
- **D** 44

12 Simplify the expression below.

$$(3x^3 + 2x^2 - 5x) + (-8x^3 + 3x)$$

- **A** $-11x^3 + 2x^2 2x$
- **B** $11x^3 2x^2 + 8x$
- **C** $-5x^3 + 2x^2 2x$

D
$$5x^3 - 2x^2 - 8x$$



WENDY'S CUP COLLECTION

Which statement correctly interprets the graph?

- A Wendy's cup collection is decreasing over time.
- **B** Wendy's cup collection is increasing over time.
- **C** Wendy's cup collection sometimes increases and sometimes decreases.
- **D** Wendy's cup collection remains the same size over time.

- 14 In order to purchase a new CD player, Rosa must save at least \$85.00. What inequality represents the amount of money, *m*, Rosa must save?
 - **A** *m* ≤ 85.00
 - **B** *m* < 85.00
 - **C** *m* ≥ 85.00
 - **D** m > 85.00



[not drawn to scale]

- **A** \angle BAC and \angle CAD
- **B** \angle CDA and \angle CAD
- $\textbf{C} \quad \angle \textbf{ABC} \text{ and } \angle \textbf{BAC}$
- **D** \angle BCA and \angle ACD



Which angles are supplementary?

- Α $\angle 1$ and $\angle 3$
- $\angle 1$ and $\angle 2$ В
- С $\angle 3$ and $\angle 6$
- D $\angle 3$ and $\angle 4$
- What is the quotient of $\frac{24x^6y^{12}z^{18}}{6x^3y^6z^9}$? 17
 - **A** $4x^2y^2z^2$

 - **B** $4x^3y^6z^9$ **C** $18x^2y^2z^2$
 - **D** $18x^3y^6z^9$

18 Based on the Pythagorean theorem, which relationship is true for the sides of the triangle shown below?



- $\textbf{A} \quad 8^2 \, + \, 10^2 \, = \, 6^2$
- **B** $6^2 + 8^2 = 10^2$
- **C** $6^2 + 8^2 = 10$
- **D** $6^2 + 10^2 = 8^2$

- **19** A 20-ounce bag of popcorn costs \$2.80. If the unit price stays the same, how much does a 35-ounce bag of popcorn cost?
 - **A** \$3.60
 - **B** \$4.00
 - **C** \$4.50
 - **D** \$4.90

$$(2x - 5)(2x - 3)$$

- **A** $4x^2 + 16x + 15$ **B** $4x^2 - 16x - 15$
- **C** $4x^2 + 16x 15$
- **D** $4x^2 16x + 15$

21 The table below shows a relationship between x and y.

x	У		
2	8		
4	10		
6	12		
8	14		
10	16		

What equation represents the relationship between x and y?

- **A** y = 2x
- **B** y = 4x
- **C** y = x + 6
- **D** y = 2x + 2

22 Bruce needs 30 five-foot pieces of rope for a school project. The hardware store sells rope by the yard. How many yards of rope will Bruce need to purchase?

- **A** 10
- **B** 30
- **C** 50
- **D** 75

23 Simplify the expression below.

$$(3a^2 + 5a - 11) - (11a^2 + 2a - 12)$$

- **A** $-8a^2 + 3a + 1$
- **B** $-8a^2 + 7a 23$
- **C** $14a^2 + 7a + 1$

D
$$14a^2 + 3a - 23$$

24 What is the product of the expression below?

(a - 3b) (2a + 2b) **A** $2a^2 - 4ab - 6b^2$ **B** $2a^2 + 4ab - 6b^2$ **C** 2a - 4ab - 6b**D** 2a + 4ab + 6b

25 In the diagram below, $\angle G$ and $\angle H$ are complementary.



What is the measure of $\angle G$?

- **A** 20°
- **B** 30°
- **C** 40°
- **D** 50°

Ms. Snyder wants to buy a television at an electronics store. All televisions at the store are $\frac{3}{4}$ of the original price, *p*. She has a \$40 discount coupon she will use during the sale. Which equation should Ms. Snyder use to find the final price, *f*, of a television?

A $f = \frac{3}{4}(p - 40)$ **B** $f = \frac{1}{4}(p - 40)$ **C** $f = \frac{1}{4}p - 40$ **D** $f = \frac{3}{4}p - 40$

26



Maria is planning a car trip from Niagara Falls to East Aurora.



What is the approximate driving distance from Niagara Falls to East Aurora?

- A 20 miles
- B 30 miles
- C 40 miles
- D 50 miles

STOP



[not drawn to scale]

What is the measure of $\angle 1$?

Show your work.

Answer _____ degrees

29 Trapezoid JKLM and its transformation trapezoid J'K'L'M' are plotted on the grid below.



Part A

Name the transformation that was applied to trapezoid JKLM to get trapezoid J'K'L'M'.

Answer _____

Part B

On the lines below, explain how you determined what transformation was applied to trapezoid JKLM to get trapezoid J'K'L'M'.

30 In the figure ABCD shown below, the total length of the sides equals 84 inches.



[not drawn to scale]

Find the length of side \overline{BC} .

Show your work.

Answer _____ inches

31 The transportation department recommends increasing highway tolls by 20% to raise money for road repairs. The current highway toll is \$1.50. What will be the **new** toll after the 20% increase?

Show your work.

Answer § _____

32 Complete the table of values for the equation y - 3x = 2.

x	у
-2	
-1	
0	
1	

Using the table of values, graph the line of the equation on the coordinate plane below.



33 Rashid wrote the sentence below.

Forty-eight is greater than or equal to four plus the product of a certain number, x, and eleven.

Write Rashid's sentence as an algebraic inequality.

Answer _____

STOP

34 For a homework assignment, Sarah must draw a line passing through the points (-3, -3) and (3, 3).

Graph Sarah's line on the grid below.



Go On

Book 3

35 Eliana and her sister are comparing the prices of two brands of cereal. Toasty Oats costs \$2.25 for a 15-ounce box. Crunchy Oaties costs \$3.90 for a 30-ounce bag.



Part A

What is the price per ounce of the Toasty Oats?

Show your work.

Answer \$ _____ per ounce

Part B

How much more expensive is Toasty Oats per ounce than Crunchy Oaties?

Answer \$ _____ per ounce



[not drawn to scale]

What is the measure of $\angle A$?

Show your work.

36

Answer _____ degrees

37 Pentagon ABCDE is plotted on the grid below.



Part A

On the grid, draw the translation of pentagon ABCDE five units to the right and three units down. Label the translated figure A'B'C'D'E'.

Part B

On the lines below, explain how you determined the location of A'.

The table below shows the number of chaperones, y, needed for a certain number of students, x, at a school dance.

SCHOOL DANCE

Number of Students (<i>x</i>)	32	48	64	96
Number of Chaperones (<i>y</i>)	4	6	8	12

Write an equation that represents the relationship between the number of chaperones needed and the number of students attending a dance.

Equation _____

How many chaperones will be needed for a dance that has 240 students?

Answer ______ chaperones



[not drawn to scale]

What is the measure of $\angle ABC$?

Show your work.

Answer _____ degrees

Week (<i>w</i>)	Balance (<i>b</i>)		
1	\$10		
2	\$24		
3	\$38		
4	\$52		
5	\$66		
6	\$80		

JEFFREY'S				
BANK ACCOUNT				

Part A

40

Using information from the table, write an equation that represents the balance, *b*, in Jeffrey's bank account as a function of the number of weeks, *w*.

Answer _____

Part B

Use your equation or the information in the table to find what Jeffrey's bank account balance will be in Week 8.

Answer § _____

41 Zach earns \$160 per week at a local market. He makes a payment of \$12 per week for a new bike. He spends \$75 each week on food and entertainment. Zach deposits the rest of his money in a savings account. Zach estimates that he deposits about 25% of the \$160 into his savings account each week.

Part A

Is Zach's estimate correct?

Answer _____

On the lines below, explain how you determined your answer.

Part B

How much of his weekly earnings would Zach need to deposit in order to save 40%?

Answer \$ _____

42 Triangle PQR is a right triangle.



[not drawn to scale]

What is the length of side x?

Show your work.

Answer _____

43 Two lines intersect at point B, as shown below.



[not drawn to scale]

Part A

What is the value of x?

Show your work.

Answer _____

Part B

What is the measure, in degrees, of $\angle ABC$?

Answer _____ degrees



Part A

On the grid, draw the image of trapezoid MNOP after a reflection over the *y*-axis. Label the new trapezoid M'N'O'P'.

Part B

On the lines below, explain how you determined the location of point M'.

45 Shawna compares the prices to download music from two different web sites.



Shawna wrote the equation below to determine when the two plans will cost the same. She uses *s* to represent the number of songs.

$$0.75s + 5 = 0.50s + 9$$

What number of songs must be downloaded for both music plans to cost the same?

Show your work.

Answer _____ songs



Standard and Performance Indicator Map with Answer Key 2007 Grade 8 Mathematics

Question	Туре	Points	Strand	Content Performance Indicator	Answer Key
Book 1					
1	Multiple Choice	1	Geometry	8.G.7	А
2	Multiple Choice	1	Number Sense and Operations	8.N.4	В
3	Multiple Choice	1	Algebra	7.A.2	С
4	Multiple Choice	1	Geometry	8.G.1	В
5	Multiple Choice	1	Algebra	7.A.4	С
6	Multiple Choice	1	Geometry	7.G.8	С
7	Multiple Choice	1	Measurement	7.M.1	D
8	Multiple Choice	1	Number Sense and Operations	8.N.4	В
9	Multiple Choice	1	Geometry	8.G.4	В
10	Multiple Choice	1	Algebra	8.A.6	С
11	Multiple Choice	1	Number Sense and Operations	8.N.2	D
12	Multiple Choice	1	Algebra	8.A.7	С
13	Multiple Choice	1	Algebra	8.A.3	В
14	Multiple Choice	1	Algebra	8.A.1	С
15	Multiple Choice	1	Geometry	8.G.2	А
16	Multiple Choice	1	Geometry	8.G.2	В
17	Multiple Choice	1	Algebra	8.A.6	В
18	Multiple Choice	1	Geometry	7.G.8	В
19	Multiple Choice	1	Measurement	7.M.5	D
20	Multiple Choice	1	Algebra	8.A.8	D
21	Multiple Choice	1	Algebra	7.A.10	С
22	Multiple Choice	1	Measurement	8.M.1	С
23	Multiple Choice	1	Algebra	8.A.7	А
24	Multiple Choice	1	Algebra	8.A.8	А
25	Multiple Choice	1	Geometry	8.G.3	D
26	Multiple Choice	1	Algebra	8.A.1	D
27	Multiple Choice	1	Measurement	7.M.1	С

Standard and Performance Indicator Map with Answer Key Grade 8 (continued)

Question	Туре	Points	Strand	Content Performance Indicator	Answer Key
Book 2					
28	Short Response	2	Geometry	8.G.5	n/a
29	Short Response	2	Geometry	8.G.7	n/a
30	Extended Response	3	Algebra	7.A.4	n/a
31	Short Response	2	Number Sense and Operations	8.N.4	n/a
32	Extended Response	3	Algebra	7.A.7	n/a
33	Short Response	2	Algebra	8.A.1	n/a
Book 3					
34	Short Response	2	Algebra	8.A.4	n/a
35	Extended Response	3	Measurement	7.M.6	n/a
36	Short Response	2	Geometry	8.G.6	n/a
37	Extended Response	3	Geometry	8.G.10	n/a
38	Short Response	2	Algebra	7.A.10	n/a
39	Short Response	2	Algebra	8.A.12	n/a
40	Short Response	2	Algebra	7.A.10	n/a
41	Extended Response	3	Number Sense and Operations	8.N.5	n/a
42	Short Response	2	Geometry	7.G.8	n/a
43	Short Response	2	Algebra	8.A.12	n/a
44	Extended Response	3	Geometry	8.G.9	n/a
45	Short Response	2	Algebra	7.A.4	n/a