



New York State Testing Program

Grade 8

Sample Test 2005 Mathematics Book 1 35 Minutes

(from the 2005 - 2006 school year)

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Be sure to read carefully all the directions in the test book.
- You may use your tools to help you solve any problem on the test.
- Read each question carefully and think about the answer before choosing your response.



This picture means that you will use your ruler.



This picture means that you will use your protractor.

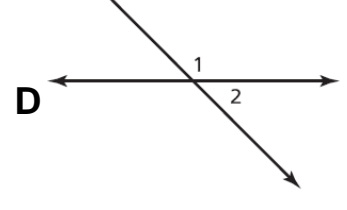
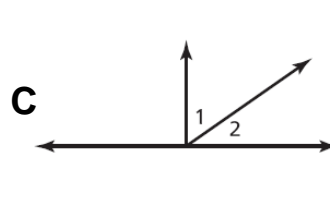
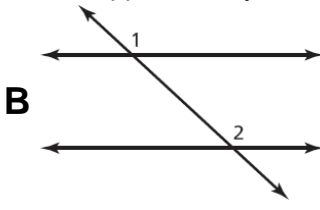
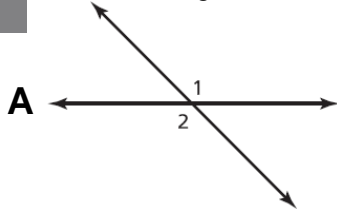
Sample A What is the greatest common factor of 12, 18, and 24? A 2 B 3 C 6 D 12

Sample B Simplify the expression below. F $10x + 1$ G $10x + 7$ H $4x + 1$ J $4x + 7$

$$7x + 4 - 3x + 3$$

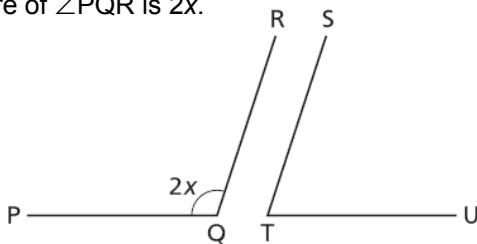
STOP

1 In which diagram are $\angle 1$ and $\angle 2$ supplementary?



2 Which expression is an equivalent form of $\frac{2x^3 + 4x^2}{2x^2}$? F $x + 2$ G $2x(x + 1)$ H $2x^2(x + 1)$ J $2x^2(x + 3)$

3 The angles shown below are supplementary. The measure of $\angle PQR$ is $2x$.



What expression represents the measure of $\angle STU$?
A $90 - 2x$ B $90 + 2x$ C $180 + 2x$ D $180 - 2x$

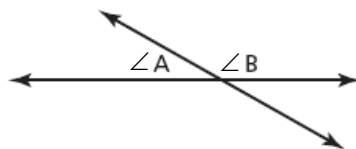
4 Simplify the expression below.
 $(3x^2y - 5xy + 12xy^2) - (5xy^2 + 4xy)$

- F $10x^2y^2 - 9xy$ G $20x^2y^2 - xy$
H $3x^2y - xy + 17xy^2$ J $3x^2y - 9xy + 7xy^2$

6 $\angle A = x + 2$ and $\angle B = 2x + 4$.

What is the measurement of $\angle A$?

- F 30° G 60°
H 90° J 120°



5 The Horseshoe Nebula is about 5.0×10^3 light years away from Earth. One light year is equal to approximately 5.9×10^{12} miles. What is the approximate distance, in miles, between Earth and the Horseshoe Nebula?

- A 2.95×10^{16} B 2.95×10^{36} C 10.9×10^{15} D 10.9×10^{36}

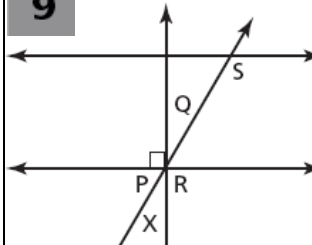
7 Multiply the two binomials below.
 $(2x - 3)(2x + 3)$

- A $4x^2 + 9$ B $4x^2 - 9$ C $4x^2 - 6x - 9$ D $4x^2 - 12x + 9$

8 Bill and Felicia each bake cookies for a party. Bill bakes 3 times as many cookies as Felicia. Felicia bakes 24 fewer cookies than Bill. Bill bakes b cookies and Felicia bakes f cookies. What pair of equations can be used to determine the number of cookies Bill and Felicia bake?

- F $b = 3(f + 24)$ G $b = 3f$ H $b = 3f$ J $f = 3b$
f = $b - 24$ f = $24 - b$ f = $b - 24$ b = $f - 2$

9 Michael drew the diagram below.



Which angle is complementary to $\angle X$?

- A $\angle P$
B $\angle Q$
C $\angle R$
D $\angle S$

Go On

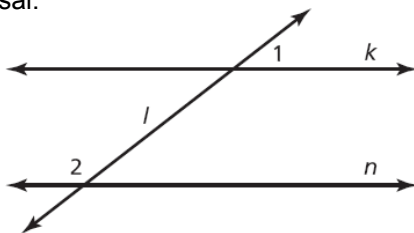
- 10** Simplify the expression. $3a^2b + 6a^2b$
F $9a^2b$ **G** $9a^4b^2$ **H** $18a^2b$ **J** $18a^4b^2$

- 11** During the summer, Breanna works at a coffee shop. She saves 75% of her earnings to buy new school clothes. If Breanna earns \$750, what is the **best** estimate for the amount of money she saves to buy clothes?
A \$100 **B** \$150 **C** \$300 **D** \$550

- 12** In the diagram below, line k and line n are parallel. Line l is a transversal.

What is the relationship between $\angle 1$ and $\angle 2$?

- F** complementary
G corresponding
H supplementary
J vertical



- 13** Hank sells toy cars on a web site. The web site fee is \$30. Hank sells each toy car for \$4. What inequality does Hank use to determine how many toy cars, c , he must sell to make a profit of **at least** \$50?

- A** $34c \leq 50$ **B** $34c \geq 50$ **C** $4c + 30 \leq 50$ **D** $4c - 30 \geq 50$

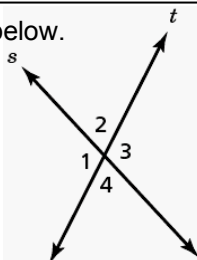
- 14** Linda must calculate the cost of filling her car's 12-gallon gas tank. She calculates the difference between how much gasoline her gas tank will hold and the number of gallons of gas, g , already in the tank. Then she multiplies the difference by the price, p , of one gallon of gas. What expression does Linda use to calculate the cost to fill her gas tank?

- F** $(12 - g)p$ **G** $gp - 12$ **H** $(g - p)12$ **J** $12p - g$

- 15** Line s and line t intersect, as shown below.

Which angles are vertical?

- A** $\angle 2$ and $\angle 3$
B $\angle 2$ and $\angle 1$
C $\angle 3$ and $\angle 4$
D $\angle 3$ and $\angle 1$

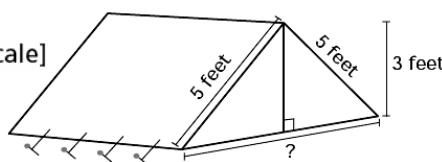


- 16** Multiply the expression below. $(3x - 5)(2x - 8)$
F $5x^2 + 3$ **G** $6x^2 - 40$
H $6x^2 + 34x + 40$ **J** $6x^2 - 34x + 40$

- 17** Tomás earns a 5% commission for each cellular phone he sells. On Tuesday, he sells a cellular phone for \$180. How much commission does Tomás earn on this sale?
A \$9 **B** \$36 **C** \$90 **D** \$189

- 18** The diagram below shows the tent that Sebastian bought to go on a camping trip.

[not drawn to scale]



Pythagorean theorem:
 $c^2 = a^2 + b^2$

How wide is the entire opening along the bottom of the tent?

- F** 4 feet **G** 5 feet **H** 6 feet **J** 8 feet

- 19** What word phrase is equivalent to the equation $y = 2x - 3$?

- A** The soccer coach is 3 years more than twice the age of his youngest team member.
B The soccer coach is 3 years less than twice the age of his youngest team member.
C The soccer coach is 2 years more than three times the age of his youngest team member.
D The soccer coach is 2 years less than three times the age of his youngest team member.

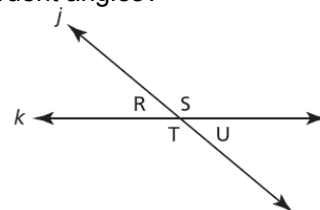
- 20** A number, n , divided by 2 is less than or equal to the product of n and 3. What inequality represents this relationship?

- F** $\frac{n}{2} \geq 3n$ **G** $\frac{n}{2} \leq 3n$
H $\frac{n}{2} \geq n + 3$ **J** $\frac{n}{2} \leq n + 3$

- 21** Line j and line k intersect, as shown below.

Which two pairs are congruent angles?

- A** $\angle R$ and $\angle S$; $\angle T$ and $\angle U$
B $\angle R$ and $\angle T$; $\angle U$ and $\angle S$
C $\angle T$ and $\angle S$; $\angle U$ and $\angle R$
D $\angle T$ and $\angle U$; $\angle T$ and $\angle S$



- 22** Simplify the expression below.
 $(3x^2 - 6x - 4) - (x^2 + 4x - 2)$

- F** $2x^2 - 10x - 2$ **G** $2x^2 - 2x - 6$
H $3x^2 - 10x - 6$ **J** $3x^2 + 10x + 2$

- 23** The table below shows the number of students who attended Walters Middle School each year during a five-year period.

What is the **approximate** percent increase in the number of students from 2000 to 2004?

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

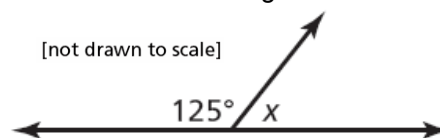
Walters Middle School	
Year	Students
2000	511
2001	548
2002	587
2003	664
2004	705

- 24** The square of a number, n , is equal to the sum of that number and 5. Which equation represents this relationship?

- F** $2n = n + 5$ **G** $n^2 = n + 5$
H $2n = n - 5$ **J** $(n + 5)^2 = n + 5$

- 25** What is the measure of $\angle X$ in the diagram below?

- A** 45° **B** 55°
C 125° **D** 180°



- 26** Simplify the expression. 4^3

- F** 7 **G** 12 **H** 43 **J** 64

- 27** Factor $y^2 + 3y - 18$ into two binomials.

- A** $(y + 9)(y - 2)$
B $(y - 9)(y + 2)$
C $(y + 6)(y - 3)$
D $(y - 6)(y + 3)$

STOP

Book 2

35 Minutes

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

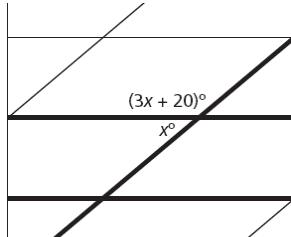
- Be sure to read carefully all the directions in the test book.
- You may use your tools to help you solve any problem on the test.
- Read each question carefully and think about the answer before writing your response.
- Be sure to show your work when asked. You may receive partial credit if you have shown your work.
- Use your calculator to help you solve the problems on this part of the test.

28 Monisha is making a quilt following the pattern shown below.

If all the horizontal lines are parallel, what is the value of x ?

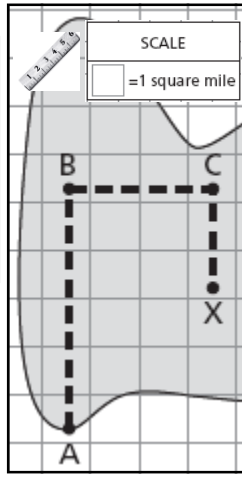
Show your work.

Answer _____



29 A path on a treasure map is shown on the grid below. Complete the table below to calculate the total length of the path.

Path Section	Length (in miles)
Length of \overline{AB}	
Length of \overline{BC}	
Length of \overline{CX}	
Total Path Length	



30 The function table below follows a function rule.

x	y
0.5	2
1	1
2	0.5
4	0.25
5	
10	

Part A

Complete the table by filling in the two missing numbers.

Part B

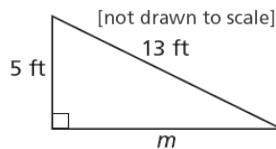
Based on the table, write a function rule that represents the relationship between x and y .

Rule _____

31 Jenna has a triangular garden, as shown in the diagram below.

What is the length, in feet, of side m ?

Answer _____ feet



Book 3

70 Minutes

34 Luisa works in her grandfather's jewelry shop. She deposits her earnings in a savings account. Her savings account balances for five of the last six weeks are shown in the function table below.

Part A According to the data in the function table, write a function rule that shows how much money Luisa saves each week.

Rule _____

Part B Based on the table, how much money is in Luisa's savings account in week 5?

Answer \$ _____

Week (w)	Savings Balance (b)
1	\$510
2	\$620
3	\$730
4	\$840
5	?
6	\$1,060



This picture means that you will use your ruler.



This picture means that you will use your protractor.

FORMULAS

Mathematics Reference Sheet

CONVERSIONS

Pythagorean Theorem

$$c^2 = a^2 + b^2$$

Simple Interest

$$I = prt$$

Distance Formula

$$d = rt$$

Temperature Conversions

$$F = \frac{9}{5}C + 32$$

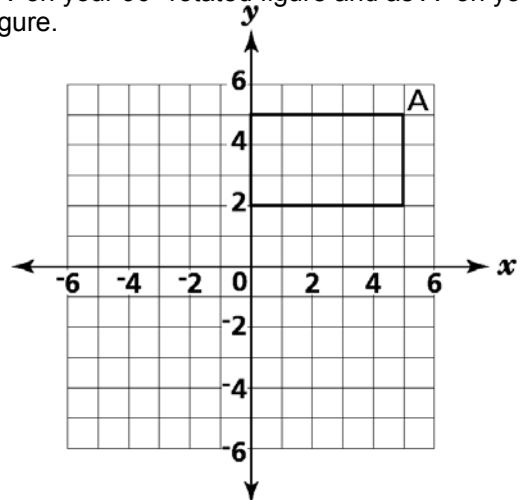
$$C = \frac{5}{9}(F - 32)$$

Measurement Conversions

$$1 \text{ mile} = 5,280 \text{ feet}$$

$$1 \text{ yard} = 3 \text{ feet}$$

32 Brian drew a rectangle on the grid below. On the same grid, rotate the rectangle **both** 90° and 180° clockwise about the origin. Label point A from the rectangle Brian drew as A' on your 90° rotated figure and as A'' on your 180° rotated figure.



33 Noel and Renaldo want to rent bikes with two other friends. They have \$150 to spend on bike rentals. The sign below shows the bike rental rates.

BIKE RENTALS

- Rent 1 bike for \$9.75 per hour.
 - **Special Group Rate**
 - For groups of 4 or more, save \$3.00 per person.
- All rates include tax.

Based on the information on the sign, the equation below can be used to determine the number of hours, h , the 4 friends can rent bikes with \$150.

$$4(9.75h - 3) = 150$$

Part A

Noel says they have enough money to rent the bikes for a maximum of 3 hours. Solve the equation for the number of hours, h , in order to determine whether Noel is correct.

Part B

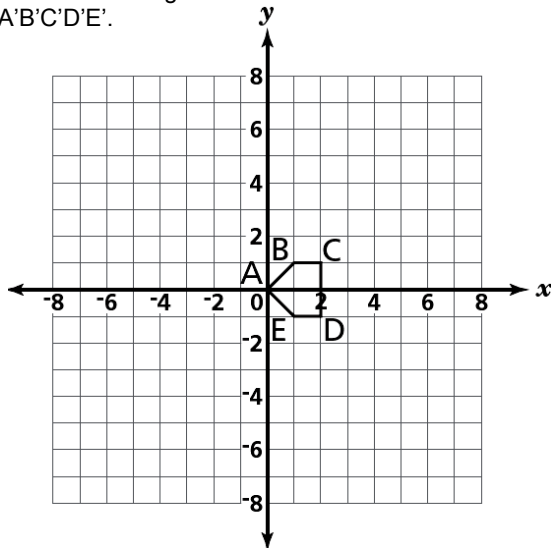
Show your work. Answer _____ hours

On the lines below, explain whether Noel is correct. (5lines)

STOP

Go On

- 35** On the grid below, draw the image of pentagon ABCDE with center at the origin after a dilation of 3. Label the image A'B'C'D'E'.

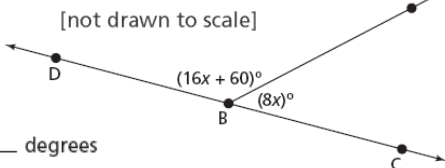


- 36** Tracy's dog eats 8 ounces of dog food every day. How many pounds of dog food will her dog eat in 40 days?

Show your work. Answer _____ pounds

- 37** In the figure below, \overline{DC} intersects \overline{BA} at point B.

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



Show your work.

Answer _____ degrees

- 38** Shane uses a grid to decide how to arrange his living room furniture. The shape and position of Shane's sofa are shown on the grid below. He moves the sofa 4 units to the right and 2 units up. On the grid below, draw the new location of Shane's sofa.

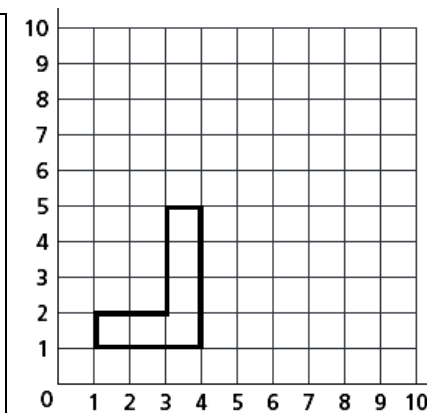
- 39**

$$3x + 6 = 24$$

$$\frac{3x}{3} + 6 = \frac{24}{3}$$

$$x + 6 = 8$$

$$x = 2$$



Juanita solved an equation incorrectly, as shown above.

- Part A** On the lines below, explain in words the mistake Juanita made. (5 lines)

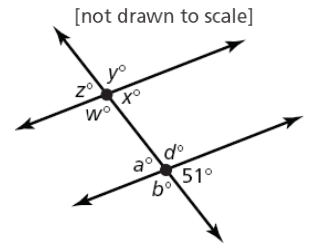
- Part B** Solve the equation $3x + 6 = 24$ correctly.

Show your work. Answer _____

- 40** Xavier bought a shirt that was on sale for 20% off the original price. He also used a coupon that gave him an additional 15% off the sale price of the shirt. The original price of the shirt was \$37. What is the new price of the shirt before tax?

Show your work. Answer \$ _____

- 41** The figure below shows parallel lines cut by a transversal.



Part A

Based on the information in the figure, complete the table below with the measures for each angle.

Angle	a°	b°	d°	w°	x°	y°	z°
Degree Measure							

- Part B** Name one pair of supplementary angles in the figure.

Answer _____

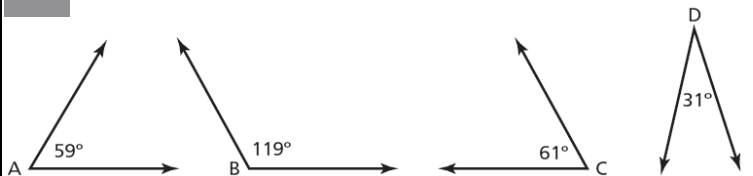
- 42** Write an equation that represents "eight less than twice a number is forty-two."

Equation _____

Solve the equation.

Show your work. Answer _____

- 43** Bryce drew the four angles shown below.



Part A

Which pair of angles are complementary? _____

Which pair of angles are supplementary? _____

Part B

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

(5 lines)

- 44** Brian and Steve want to compare the prices of their favorite cereals to determine which is less expensive.

The table below shows the price of each box of cereal and the number of ounces in each box.

	Total Weight (in ounces)	Total Price (per box)	Price (per ounce)
Brian's Cereal	24 oz.	\$3.84	
Steve's Cereal	32 oz.	\$4.48	

- Part A** Complete the table above by calculating the price per ounce of each kind of cereal.

- Part B** Whose cereal is less expensive per ounce?

Show your work. Answer _____

- 45** In the figure below, lines k and n are parallel. Line l is a transversal.

- Part A** What is the value of x ?

Show your work.

Answer _____

Part B

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

Show your work.

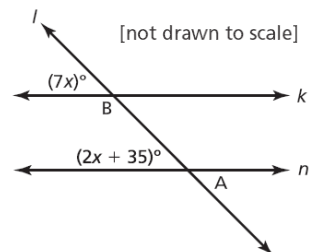
Answer _____ degrees

Part C

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

Show your work.

Answer _____ degrees



STOP