



New York State Testing Program

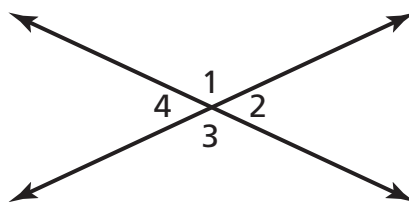
Mathematics Test Book 1

Grade **8**

March 6–12, 2008

1

In the diagram below, which pair of angles has the same measure?



[not drawn to scale]

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

2

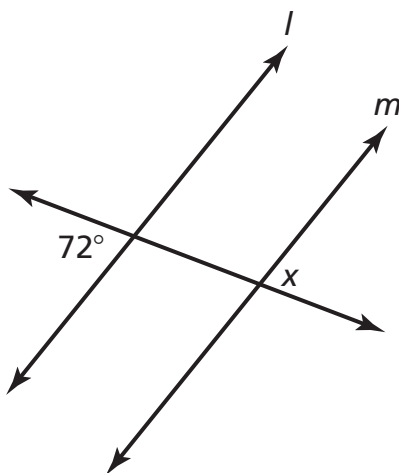
Which situation is **best** represented by the expression $4h + 2$?

- A** Kepa spends 4 hours babysitting and 2 hours traveling.
- B** Kepa spends 4 hours babysitting and receives \$2 in travel expenses.
- C** Kepa will be paid \$4 for babysitting and spends 2 hours traveling.
- D** Kepa will be paid \$4 for every hour of babysitting plus \$2 for travel costs.

Go On

3

In the diagram below, line l and line m are parallel.



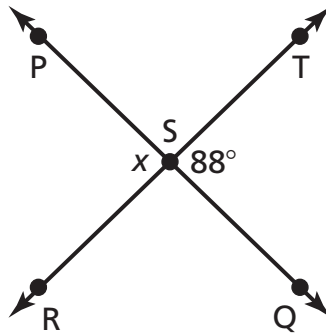
[not drawn to scale]

What is the measure of $\angle x$?

- A** 18°
- B** 72°
- C** 108°
- D** 162°

4

In the diagram below, \overleftrightarrow{PQ} intersects \overleftrightarrow{RT} at point S, and the measure of $\angle TSQ$ is 88° .



[not drawn to scale]

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

- A 88
- B 92
- C 178
- D 268

5

Simplify the expression below.

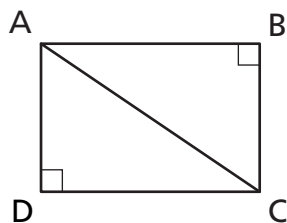
$$5x(2x - 5)$$

- A $10x - 5$
- B $10x^2 - 5$
- C $10x - 25x$
- D $10x^2 - 25x$

Go On

6

Rectangle ABCD is formed by triangle ABC and triangle ACD, as shown below.



Which side of triangle ABC is the hypotenuse?

- A** \overline{AB}
- B** \overline{AC}
- C** \overline{BC}
- D** \overline{CD}

7

What is the simplified form of the expression below?

$$\frac{8x^6 - 6x^3}{2x^2}$$

- A** $4x^3 - 3$
- B** $4x^4 - 3$
- C** $4x^3 - 3x$
- D** $4x^4 - 3x$

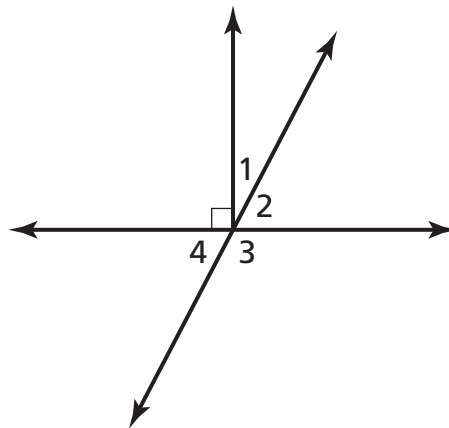
8

Lamar claims that the weight, w , of her cat is **at most** 11 pounds. What inequality represents her claim?

- A** $w \leq 11$
- B** $w \geq 11$
- C** $w < 11$
- D** $w > 11$

9

In the diagram below, which pair of angles is complementary?



[not drawn to scale]

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

Go On

10

Jessica went shopping for a new watch. She found a watch that was originally priced at \$50 on sale for \$40. By what percent had the watch been marked down?

- A** 10%
- B** 20%
- C** 25%
- D** 40%

11

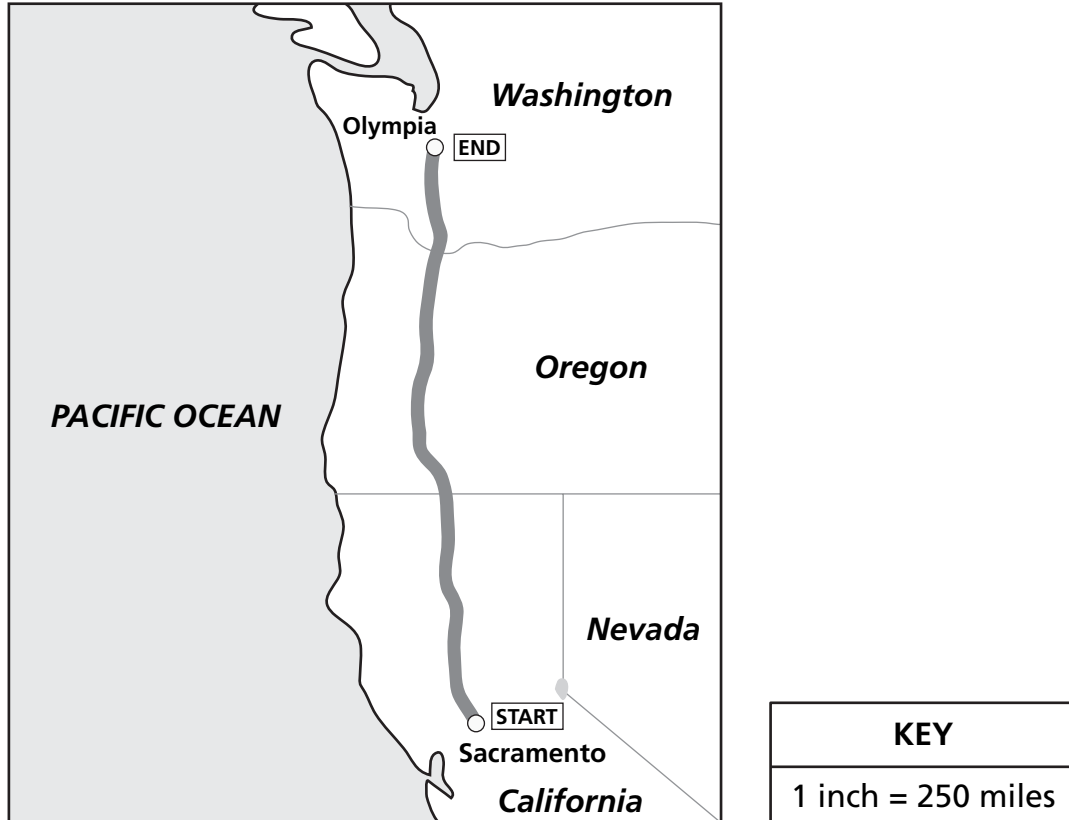
Multiply $(a + 2)(3a - 1)$.

- A** $3a^2 - 2$
- B** $3a^2 + 5a$
- C** $3a^2 + 4a - 2$
- D** $3a^2 + 5a - 2$



Use your ruler to help you solve this problem.

Diane is taking a trip from Sacramento, California, to Olympia, Washington. Her route is shown on the map below.



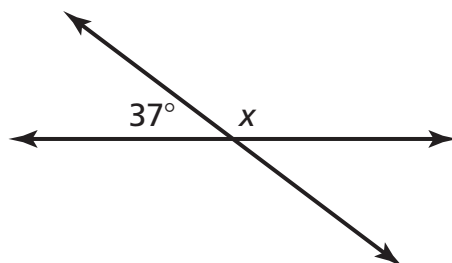
According to the map, what is the **approximate** distance from Sacramento, California, to Olympia, Washington?

- A 625 miles
- B 750 miles
- C 875 miles
- D 1,000 miles

Go On

13

In the diagram below, what is the measure of angle x ?



[not drawn to scale]

- A** 37°
- B** 53°
- C** 127°
- D** 143°

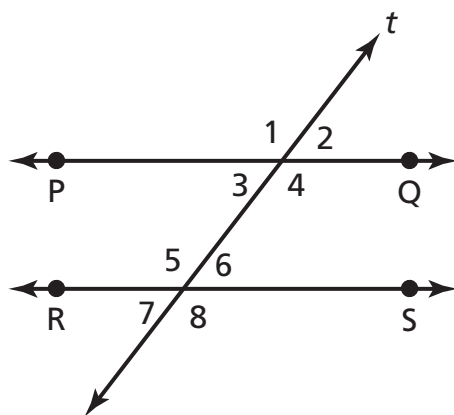
14

The cost of Cynthia's dinner is \$15.20. She pays an additional tip that is 20% of the cost of the dinner. What is the **best** estimate for the amount of the tip?

- A** \$2.00
- B** \$3.00
- C** \$4.00
- D** \$5.00

15

In the diagram below, $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$, and transversal t intersects both lines.



[not drawn to scale]

Which angle is the same size as $\angle 7$?

- A $\angle 1$
- B $\angle 3$
- C $\angle 4$
- D $\angle 5$

16

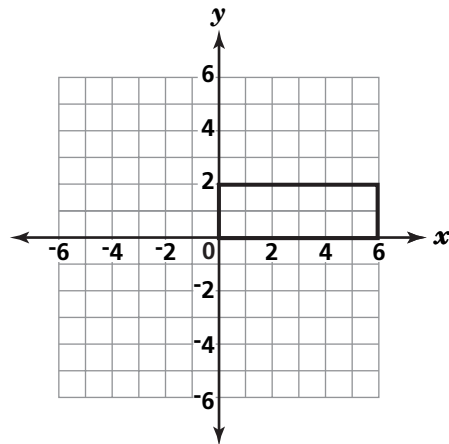
Find the value of x in the equation below.

$$3(x + 2) = x$$

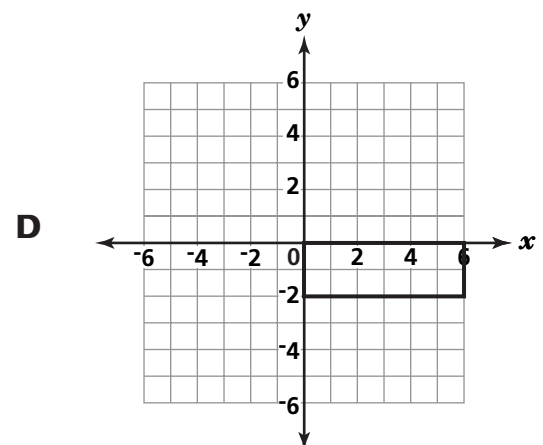
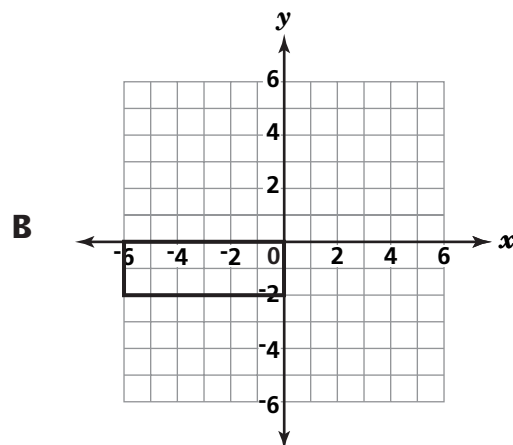
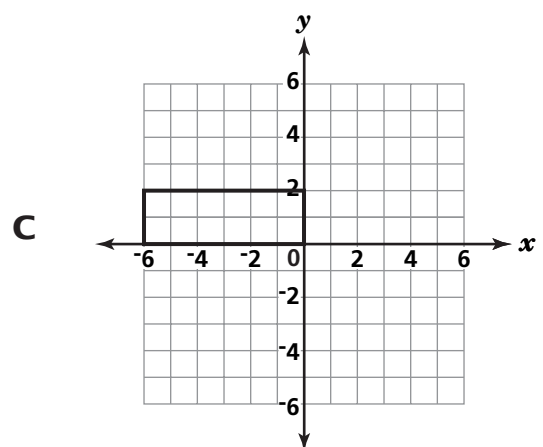
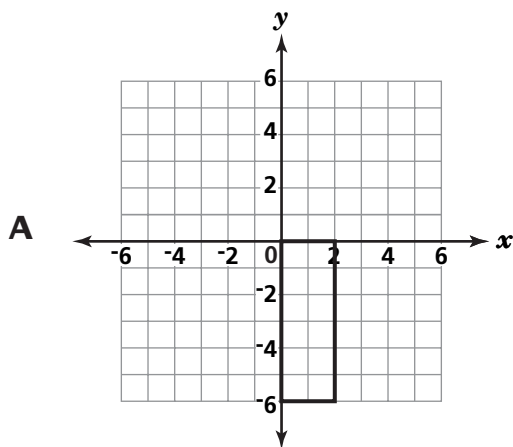
- A -3
- B -1
- C 2
- D 3

Go On

A rectangle is plotted on the coordinate plane below.



Which image shows a 90° clockwise rotation about the origin?



- 18** What verbal expression is the same as the algebraic expression below?

$$8 - 3x$$

- A** three times a number minus eight
- B** three minus eight times a number
- C** eight times a number minus three
- D** eight minus three times a number

- 19** Simplify the expression below.

$$\frac{12x^2y^3}{3xy}$$

- A** $4xy^2$
- B** $4x^2y^2$
- C** $\frac{4}{xy^2}$
- D** $\frac{4x}{y^2}$

Go On

20

Simplify the expression below.

$$10y^2 - 15y^2$$

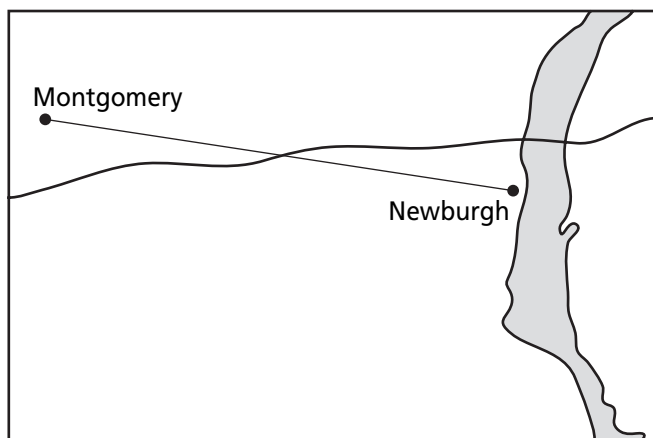
- A -5
- B 5
- C $-5y^2$
- D $-5y^4$

21



Use your ruler to help you solve this problem.

Each morning, a bird flies from his tree in Montgomery to his favorite feeder in Newburgh, as shown in the scale drawing below.

**SCALE**

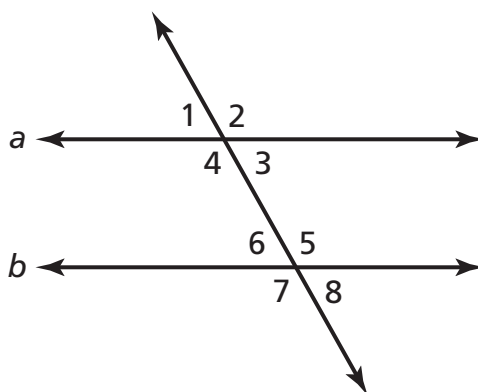
1 inch = 5 miles

Approximately how many miles does the bird fly from the tree to the feeder each morning?

- A 2
- B 6
- C 13
- D 18

22

In the diagram below, lines a and b are parallel.



[not drawn to scale]

Which angle is supplementary to $\angle 2$?

- A** $\angle 3$
- B** $\angle 4$
- C** $\angle 5$
- D** $\angle 7$

23

Factor the expression below using the greatest common factor (GCF).

$$12n^5 + 8n^3 + 6n$$

- A** $2n(6n^4 + 4n^2 + 3)$
- B** $2n(6n^5 + 4n^3 + 3n)$
- C** $2n(12n^5 + 4n^2 + 6)$
- D** $2n(6n^4 + 8n^3 + 6n)$

Go On

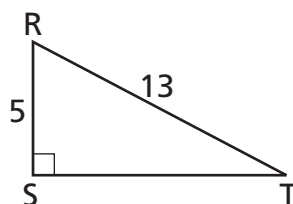
24

Which of these phrases **best** describes a polynomial?

- A** a decimal that is non-terminating or non-repeating
- B** an algebraic expression containing one or more terms
- C** a close-planed figure formed by three or more line segments
- D** a number greater than one that has exactly two different factors

25

Triangle RST is shown below.



[not drawn to scale]

Pythagorean theorem:

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

What is the length of \overline{ST} ?

- A** 5
- B** 8
- C** 12
- D** 18

26

The area of triangle RST is 36 square inches. Under which transformation could the area of the image, triangle R'S'T', be greater than 36 square inches?

- A dilation
- B reflection
- C rotation
- D translation

27

Simplify the expression below.

$$4k^2 + 5k - 3 + 5k^2 + 2$$

- A $4k^2 + 10k - 1$
- B $9k^2 + 5k - 1$
- C $9k^2 + 7k - 3$
- D $14k^2 + 5k - 1$

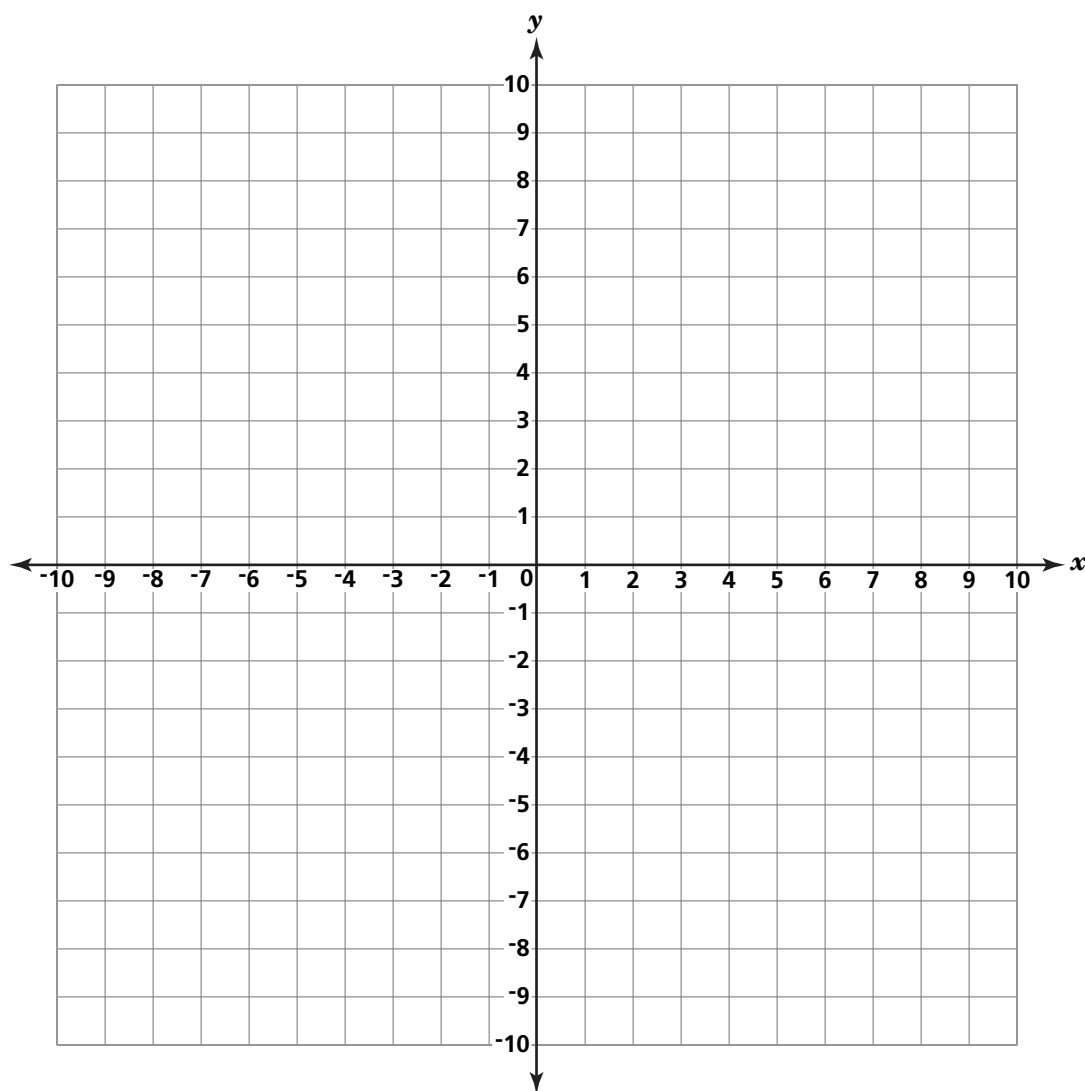
STOP

The table below shows values for x and y when $y = 3x - 2$.

x	-2	-1	0	1	2
y	-8	-5	-2	1	

Complete the table by finding the value of y when $x = 2$.

Plot the ordered pairs shown in the table onto the coordinate plane below. Then draw a line connecting the points.



A point on the line has an x -coordinate of 3. What is its corresponding y -coordinate?

Answer _____

Go On

29

Coretta buys a pair of jeans that is on sale for 20% off. The regular price is marked as \$27.00. What is the sale price of the pair of jeans?

Show your work.

Answer \$ _____

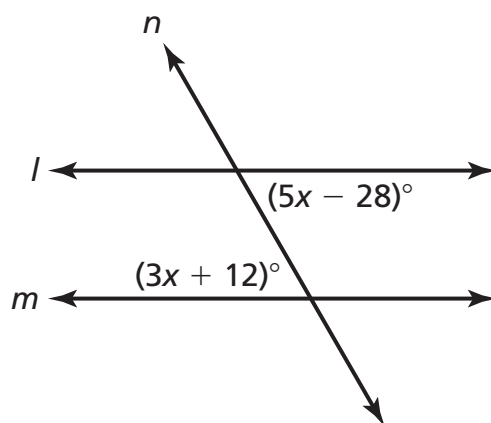
30

Rita multiplied the monomials $12a^3b^6$ and $3ab^2$ as shown below.

$$(12a^3b^6)(3ab^2) = 36a^4b^8$$

Is Rita's answer correct? On the lines below, explain how you determined your answer.

In the diagram below, line l and line m are parallel.



[not drawn to scale]

Solve for x .

Show your work.

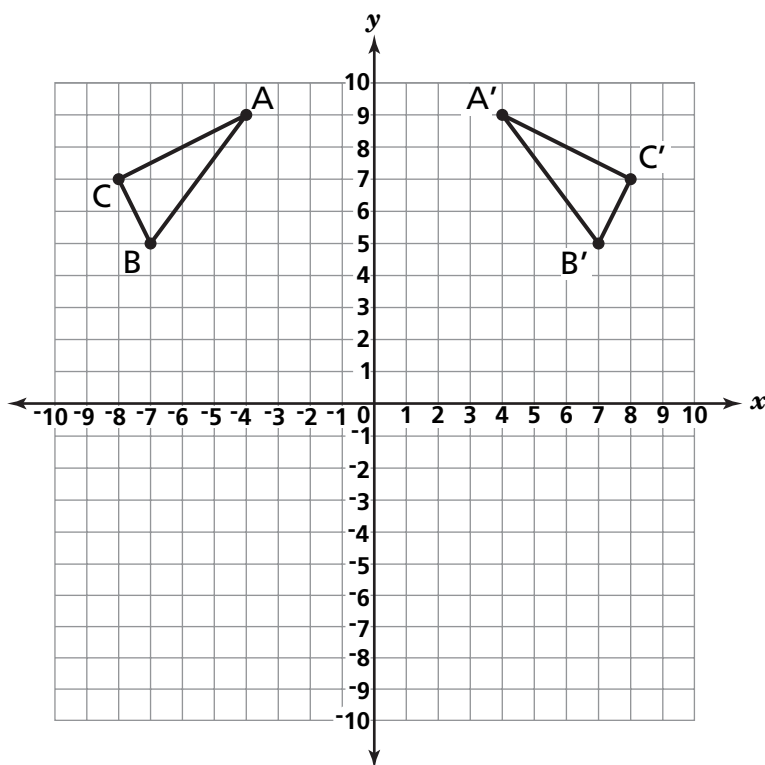
Answer $x =$ _____

What is the measure of the angle represented by $5x - 28$?

Answer _____ degrees

Go On

Triangle ABC and triangle A'B'C' are plotted on the coordinate plane below.



What is the name of the transformation applied to triangle ABC that resulted in triangle A'B'C' ?

Answer _____

On the lines below, describe how the coordinates of point A changed to the coordinates of point A'.

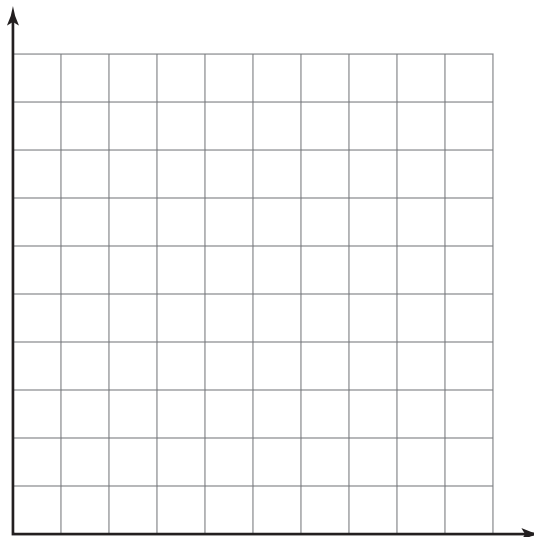
Go On

33

A pool is being filled with water. It already contains 100 gallons of water and it continues to be filled at a constant rate. Complete the table below to show the number of gallons of water in the pool after 3 minutes and after 4 minutes.

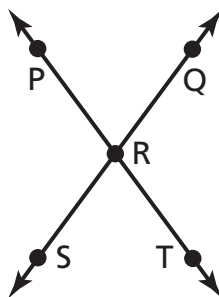
Time in Minutes (<i>m</i>)	Gallons of Water (<i>g</i>)
0	100
1	120
2	140
3	
4	

Plot the ordered pairs from the table onto the graph paper below. Then draw a line segment connecting the points.

**STOP**

34

In the diagram below, $\angle PRQ$ measures 73° .



[not drawn to scale]

What is the measure of $\angle QRT$?

Show your work.

Answer _____ degrees

Go On

What is the polynomial resulting from the subtraction below?

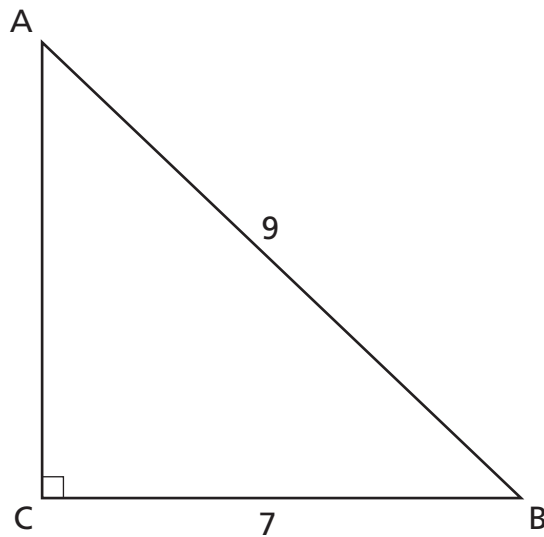
$$(3x^2 + 4x - 7) - (x^2 - 2x + 6)$$

Show your work.

Answer _____

36

In triangle ABC below, \overline{AB} is 9 meters long and \overline{BC} is 7 meters long. Use the Pythagorean theorem to find the length of \overline{AC} to the **nearest tenth** of a meter.



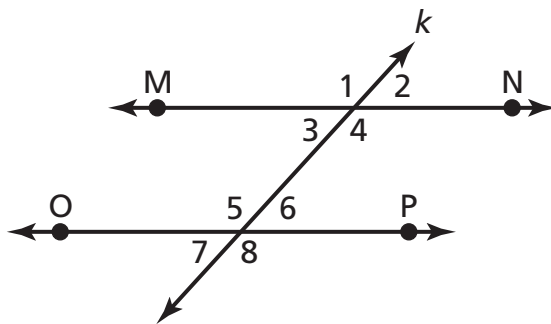
[not drawn to scale]

Show your work.

Answer _____ meters

Go On

In the diagram below, $\overleftrightarrow{MN} \parallel \overleftrightarrow{OP}$, and transversal k intersects both lines.



[not drawn to scale]

Name two angles in the diagram that are congruent to $\angle 4$.

Answer \angle _____ and \angle _____

On the lines below, explain how you determined these angles are congruent to $\angle 4$.

Tyrone travels internationally on business. On a trip to Japan, Tyrone uses the exchange rates in the tables shown below.

U.S. Dollar	Japanese Yen
\$1.00	115.19¥

Japanese Yen	U.S. Dollar
1¥	\$0.008681

What is the value of 75 U.S. dollars in Japanese yen? **Round** your answer to the nearest yen.

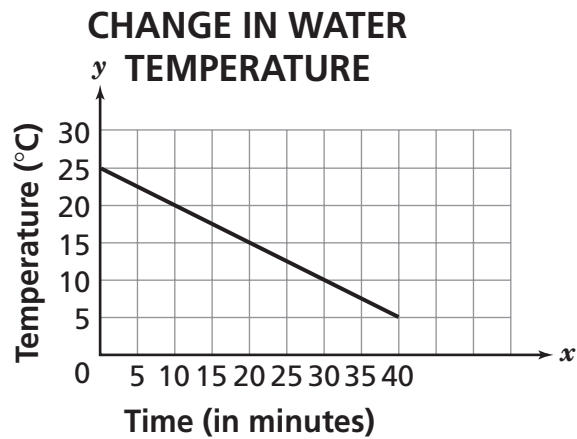
Show your work.

Answer _____ ¥

Go On

39

The graph below shows the change in water temperature of a glass of tap water placed into a freezer.



Use information in the graph to determine how many **total minutes** it takes the water to reach 0°C .

Answer _____ minutes

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

Ramona is a travel agent. She receives a 6% commission on vacation package sales.

Part A

How much commission will Ramona make if she sells \$3,600 in vacation packages?

Show your work.

Answer \$ _____

Part B

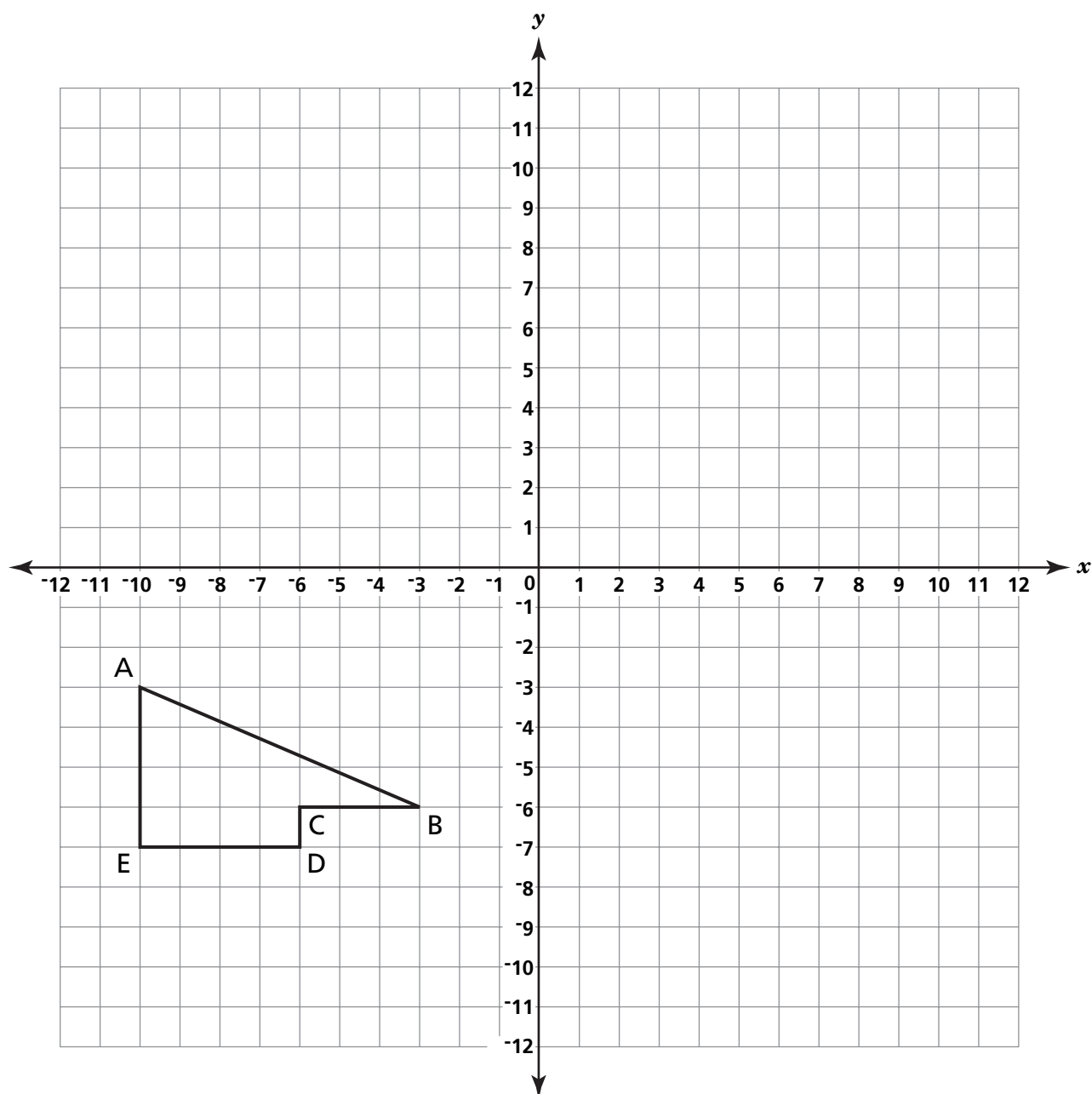
Ramona receives an additional 2% bonus on the sale of vacation packages during February. What would be her combined commission and bonus if she sells \$3,600 in vacation packages during February?

Answer \$ _____

Go On

41

On the coordinate plane below, draw the image of polygon ABCDE translated 8 units to the right and 4 units up. Label the image $A'B'C'D'E'$.



Consuelo is grocery shopping and sees that the price of 4 melons is \$7.00. Write a proportion that Consuelo can use to find the price of 1 melon.

Proportion _____

Use your proportion to find the price of 1 melon.

Show your work.

Answer \$ _____

Go On

The table below shows the coordinates of triangle RST and the coordinates of R' in triangle R'S'T'. Triangle R'S'T' is a dilation of triangle RST.

Triangle RST		Triangle R'S'T'	
R	$(-2, -3)$	R'	$(-6, -9)$
S	$(0, 2)$	S'	
T	$(2, -3)$	T'	

Part A

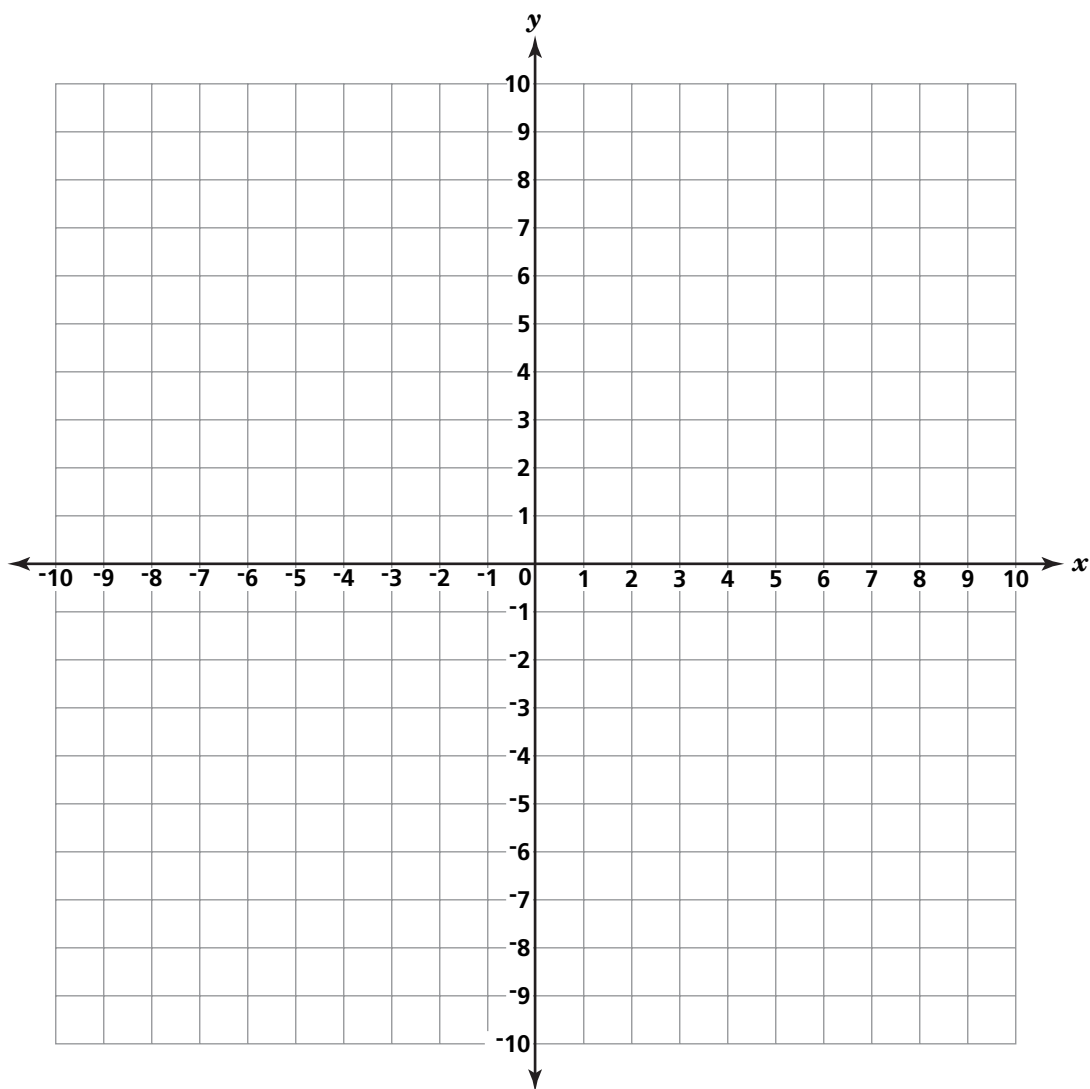
What are the coordinates of point S' and point T'?

Answer $S' = (\text{ } , \text{ })$

$T' = (\text{ } , \text{ })$

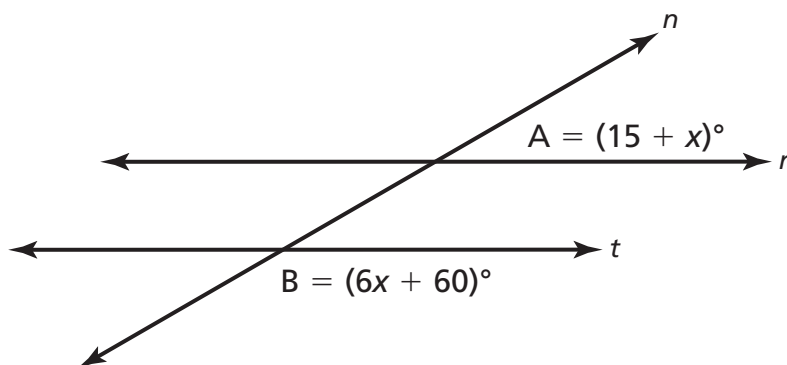
Part B

On the grid below, draw triangle RST and triangle R'S'T'.



Go On

In the diagram below, line r and line t are parallel. Line n is a transversal.



[not drawn to scale]

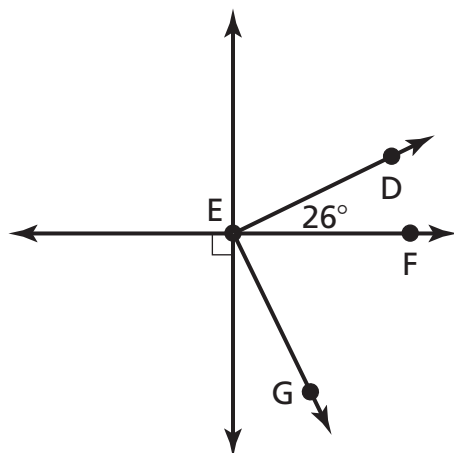
What is the measure, in degrees, of $\angle A$?

Show your work.

Answer _____ degrees

45

In the diagram below, $\angle DEF$ and $\angle FEG$ are complementary.



[not drawn to scale]

What is the measure of $\angle FEG$?

Show your work.

Answer _____ degrees

STOP

2008 Mathematics Tests Standard and Performance Indicator Map with Answer Key
Grade 8

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1					
1	Multiple Choice	1	Geometry	8.G01 Identify pairs of vertical angles as congruent	D
2	Multiple Choice	1	Algebra	8.A02 Write verbal expressions that match given mathematical expressions	D
3	Multiple Choice	1	Geometry	8.G05 Calculate the missing angle measurements when given two parallel lines cut by a transversal	B
4	Multiple Choice	1	Geometry	8.G06 Calculate the missing angle measurements when given two intersecting lines and an angle	A
5	Multiple Choice	1	Algebra	8.A08 Multiply a binomial by a monomial or binomial (integer coefficients)	D
6	Multiple Choice	1	Geometry	7.G05 Identify the right angle, hypotenuse, and legs of a right triangle	B
7	Multiple Choice	1	Algebra	8.A09 Divide a polynomial by a monomial (integer coefficients) Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables	D
8	Multiple Choice	1	Algebra	8.A01 Translate verbal sentences into algebraic inequalities	A
9	Multiple Choice	1	Geometry	8.G02 Identify pairs of supplementary and complementary angles	A
10	Multiple Choice	1	Number Sense and Operations	8.N04 Apply percents to: tax, percent increase/decrease, simple interest, sale price, commission, interest rates, and gratuities	B
11	Multiple Choice	1	Algebra	8.A08 Multiply a binomial by a monomial or binomial (integer coefficients)	D
12	Multiple Choice	1	Measurement	7.M01 Calculate distance using a map scale	B
13	Multiple Choice	1	Geometry	8.G03 Calculate the missing angle in a supplementary or complementary pair	D
14	Multiple Choice	1	Number Sense and Operations	8.N05 Estimate a percent of a quantity, given an application	B
15	Multiple Choice	1	Geometry	8.G04 Determine angle pair relationship when given two parallel lines cut by a transversal	B
16	Multiple Choice	1	Algebra	7.A04 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation	A
17	Multiple Choice	1	Geometry	8.G08 Draw the image of a figure under rotations of 90 and 180 degrees	A

2008 Mathematics Tests Standard and Performance Indicator Map with Answer Key
Grade 8 (continued)

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1 (continued)					
18	Multiple Choice	1	Algebra	8.A02 Write verbal expressions that match given mathematical expressions	D
19	Multiple Choice	1	Algebra	8.A06 Multiply and divide monomials	A
20	Multiple Choice	1	Algebra	7.A02 Add and subtract monomials and exponents of one	C
21	Multiple Choice	1	Measurement	7.M01 Calculate distance using a map scale	C
22	Multiple Choice	1	Geometry	8.G02 Identify pairs of supplementary and complementary angles	A
23	Multiple Choice	1	Algebra	8.A10 Factor algebraic expressions using the GCF	A
24	Multiple Choice	1	Algebra	7.A03 Identify a polynomial as an algebraic expression containing one or more terms	B
25	Multiple Choice	1	Geometry	7.G08 Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle	C
26	Multiple Choice	1	Geometry	8.G12 Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation	A
27	Multiple Choice	1	Algebra	8.A07 Add and subtract polynomials (integer coefficients)	B
Book 2					
28	Extended Response	3	Algebra	8.A16 Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line	n/a
29	Short Response	2	Number Sense and Operations	8.N04 Apply percents to: tax, percent increase/decrease, simple interest, sale price, commission, interest rates, and gratuities	n/a
30	Short Response	2	Algebra	8.A06 Multiply and divide monomials	n/a
31	Extended Response	3	Algebra	8.A12 Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines	n/a
32	Short Response	2	Geometry	8.G07 Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations)	n/a
33	Short Response	2	Algebra	7.A07 Draw the graphic representation of a pattern from an equation or from a table of data	n/a

**2008 Mathematics Tests Standard and Performance Indicator Map with Answer Key
Grade 8 (continued)**

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 3					
34	Short Response	2	Geometry	8.G06 Calculate the missing angle measurements when given two intersecting lines and an angle	n/a
35	Short Response	2	Algebra	8.A07 Add and subtract polynomials (integer coefficients)	n/a
36	Short Response	2	Geometry	7.G08 Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle	n/a
37	Short Response	2	Geometry	8.G04 Determine angle pair relationship when given two parallel lines cut by a transversal	n/a
38	Short Response	2	Measurement	7.M07 Convert money between different currencies with the use of an exchange rate table and calculator	n/a
39	Short Response	2	Algebra	8.A03 Describe a situation involving relationships that matches a given graph	n/a
40	Extended Response	3	Number Sense and Operations	8.N04 Apply percents to: tax, percent increase/decrease, simple interest, sale price, commission, interest rates, and gratuities	n/a
41	Extended Response	3	Geometry	8.G10 Draw the image of a figure under a translation	n/a
42	Extended Response	3	Measurement	7.M05 Calculate unit price using proportions	n/a
43	Extended Response	3	Geometry	8.G11 Draw the image of a figure under a dilation	n/a
44	Short Response	2	Algebra	8.A12 Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines	n/a
45	Short Response	2	Geometry	8.G03 Calculate the missing angle in a supplementary or complementary pair	n/a