1 In the diagram below, which pair of angles has the same measure?
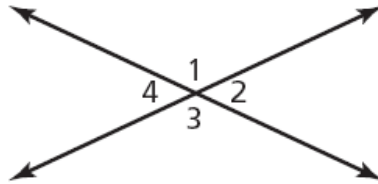
[not drawn to scale]

A ∠1 and ∠2

**B** ∠1 and ∠4

C ∠2 and ∠3

D ∠2 and ∠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.

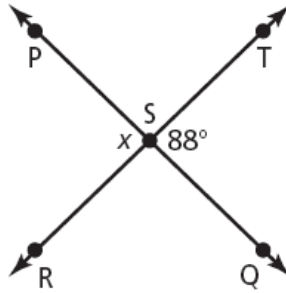**3**   In the diagram below, line *l* and line *m* are parallel.

l

m

72°

x
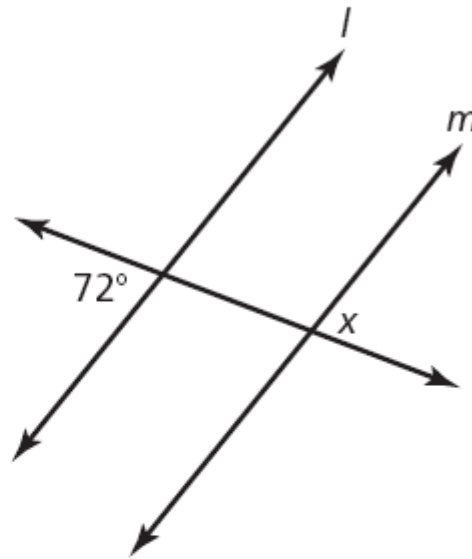
[not drawn to scale]

What is the measure of ∠*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 $\angle x$?
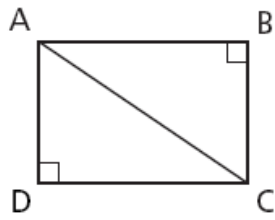
A   88

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 $10x^2 - 25x$

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 $4x^3 - 3$

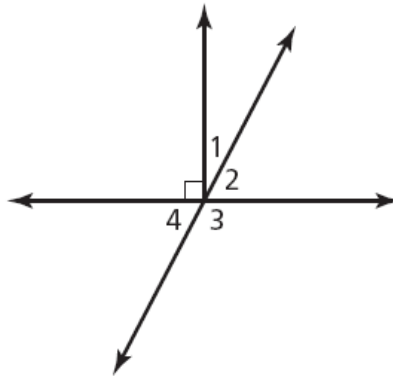**B** $4x^4 - 3$

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 $\angle 4$

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%

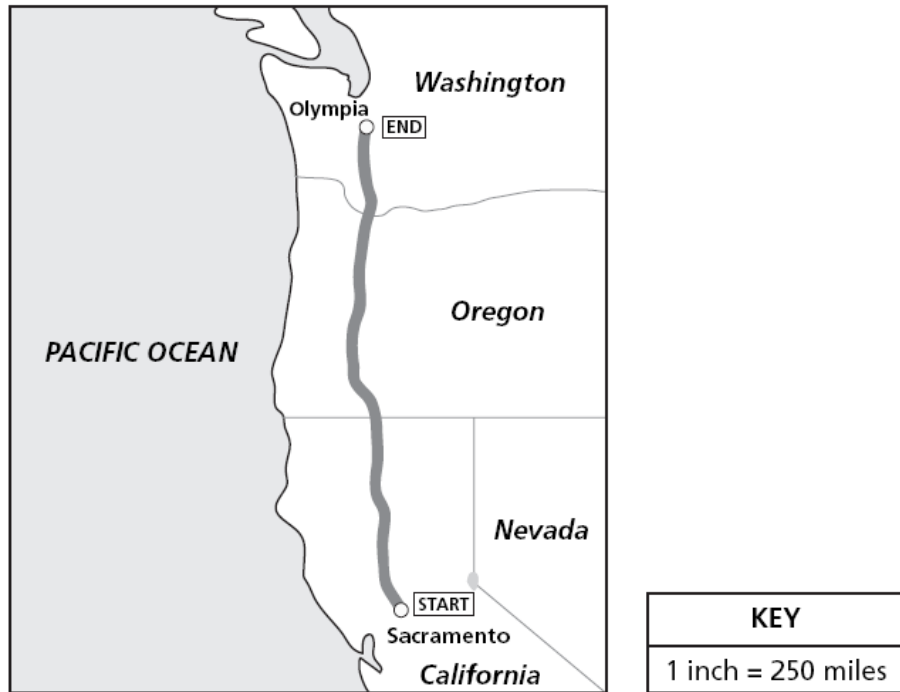**D** 40%

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

A $3a^2 - 2$

B $3a^2 + 5a$

C $3a^2 + 4a - 2$

D $3a^2 + 5a - 2$

12 Use your ruler to help you solve this problem.

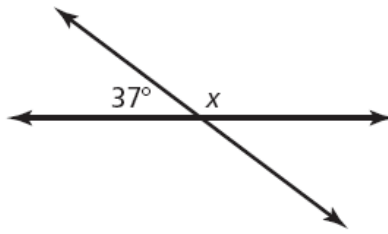Diane is taking a trip from Sacramento, California, to Olympia, Washington. Her route is shown on the map below.

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

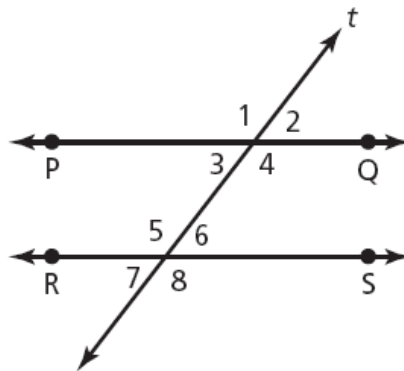**13** In the diagram below, what is the measure of angle *x*?

[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 $\angle 1$
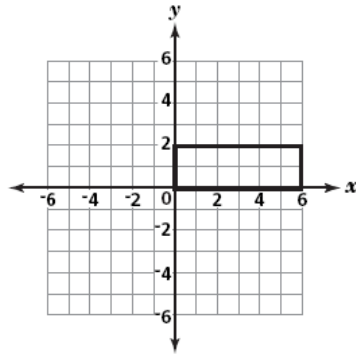
B $\angle 3$

C $\angle 4$

D $\angle 5$

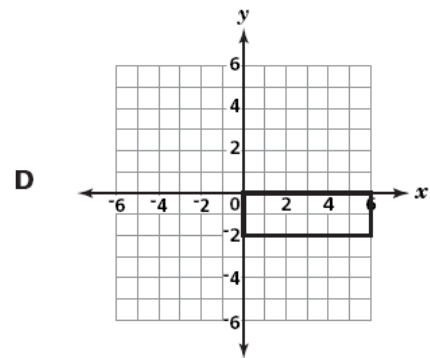**16** Find the value of x in the equation below.

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

A -3

B -1

C 2

D 3

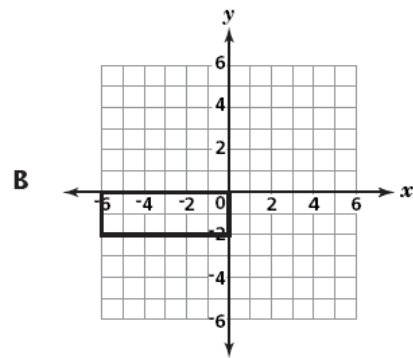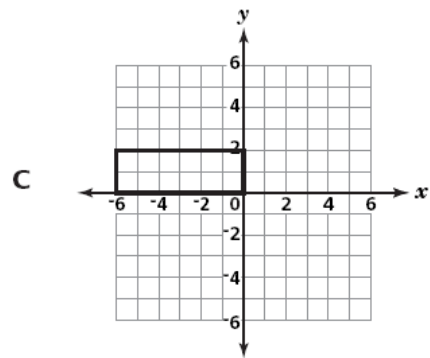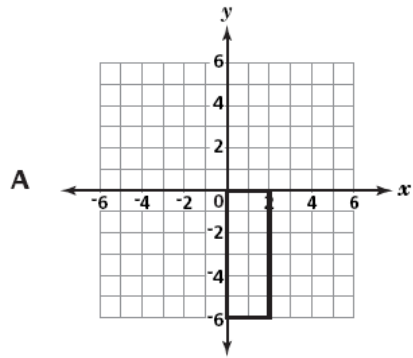**17** A rectangle is plotted on the coordinate plane below.

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

A

C

B

D

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 $\dfrac{4}{xy^2}$

D $\dfrac{4x}{y^2}$

20 Simplify the expression below.
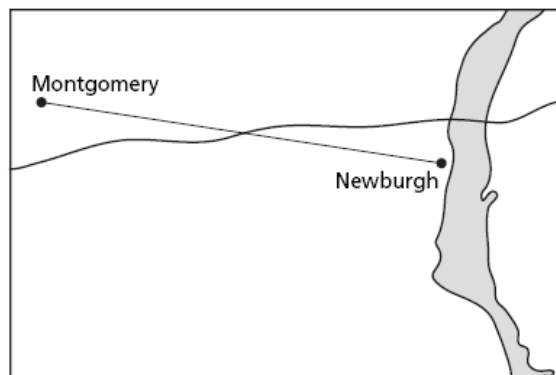
$$10y^2 - 15y^2$$

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.
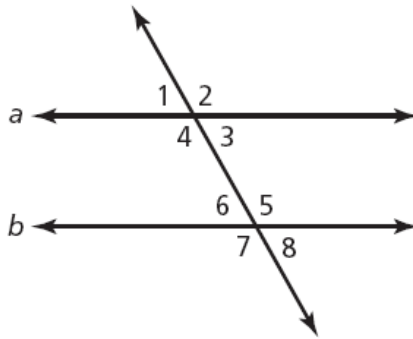

SCALE
1 inch = 5 miles

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 $2n(12n^5 + 4n^2 + 6)$
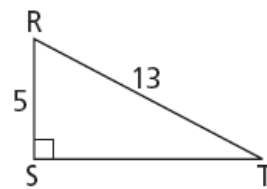
D $2n(6n^4 + 8n^3 + 6n)$

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.

R

13

5

S   T

[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 $14k^2 + 5k - 1$