Each pair of figures is similar. Find the missing side. (MCC8.G.4)

1)

(handwritten): $\frac{18}{x} = \frac{3}{9}$ $3x = 162$ $x = 54$

A) 54   B) 108
C) 18   D) 9

Answer each question and round your answer to the nearest whole number.

2) A model tree is 3 cm tall. If it was built with a scale of 1 cm : 6 m, then how tall is the real tree?

(handwritten): $\frac{3}{1} = \frac{x}{6}$ $x = 18$

A) 9 m   B) 1 m
C) 18 m   D) 2 m

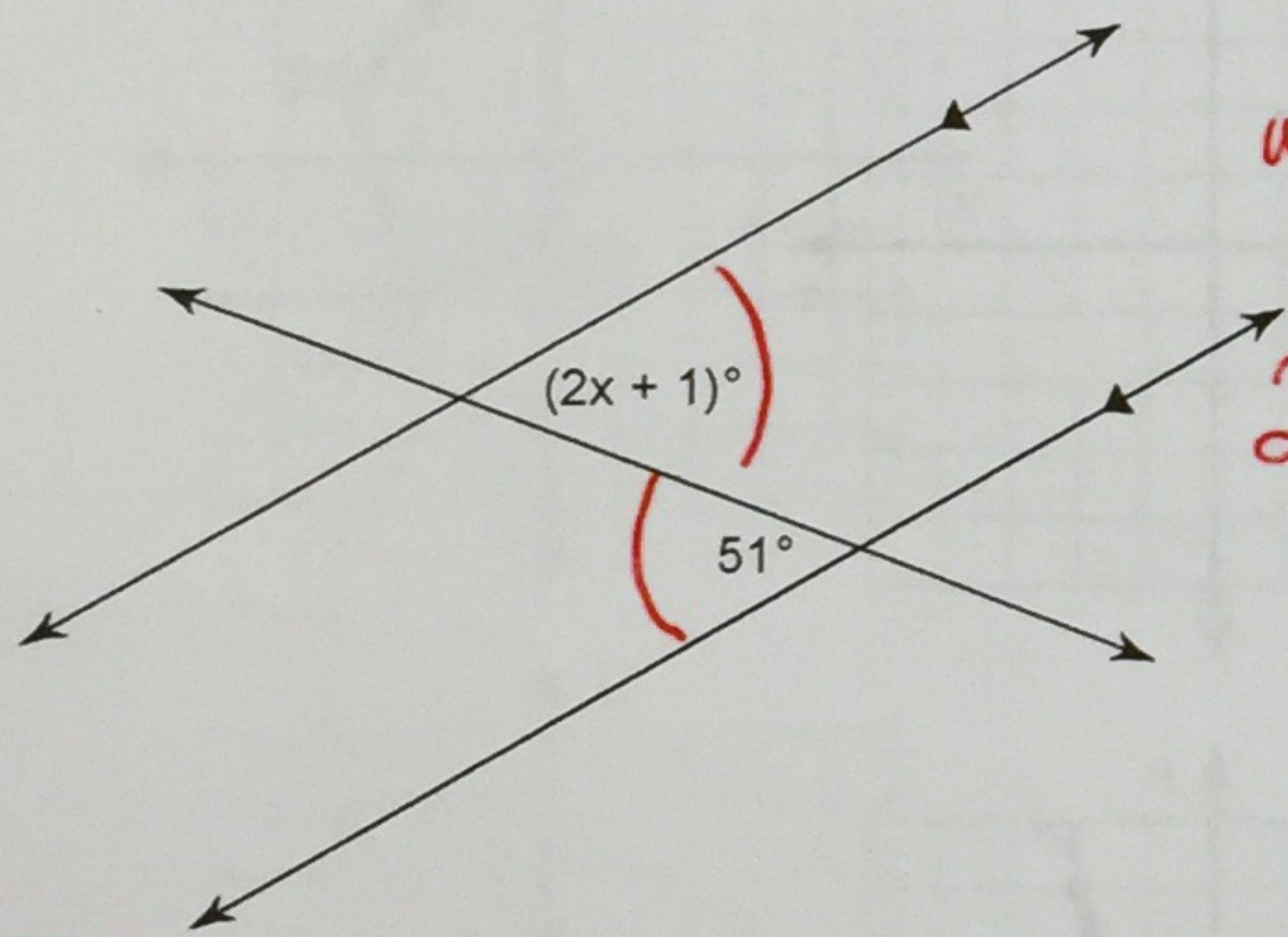**Solve each proportion.**

3) $\frac{9}{13} = \frac{r}{18}$

(handwritten): $13r = 162$ $r = 12.46$

A) {12.46}   B) {9}
C) {19.1}   D) {9.4}

Find the value of x.

4)

$(2x + 1)°$ $51°$

(handwritten): alt. int $\angle$s
$2x + 1 = 51$
$\underline{-1 \quad -1}$
$2x = 50$
$x = 25$

A) 25   B) 37
C) 29   D) 31

5)

$117°$ $(x + 24)°$

(handwritten): straight line = 180°
$117 + x + 24 = 180$
$x = 39$
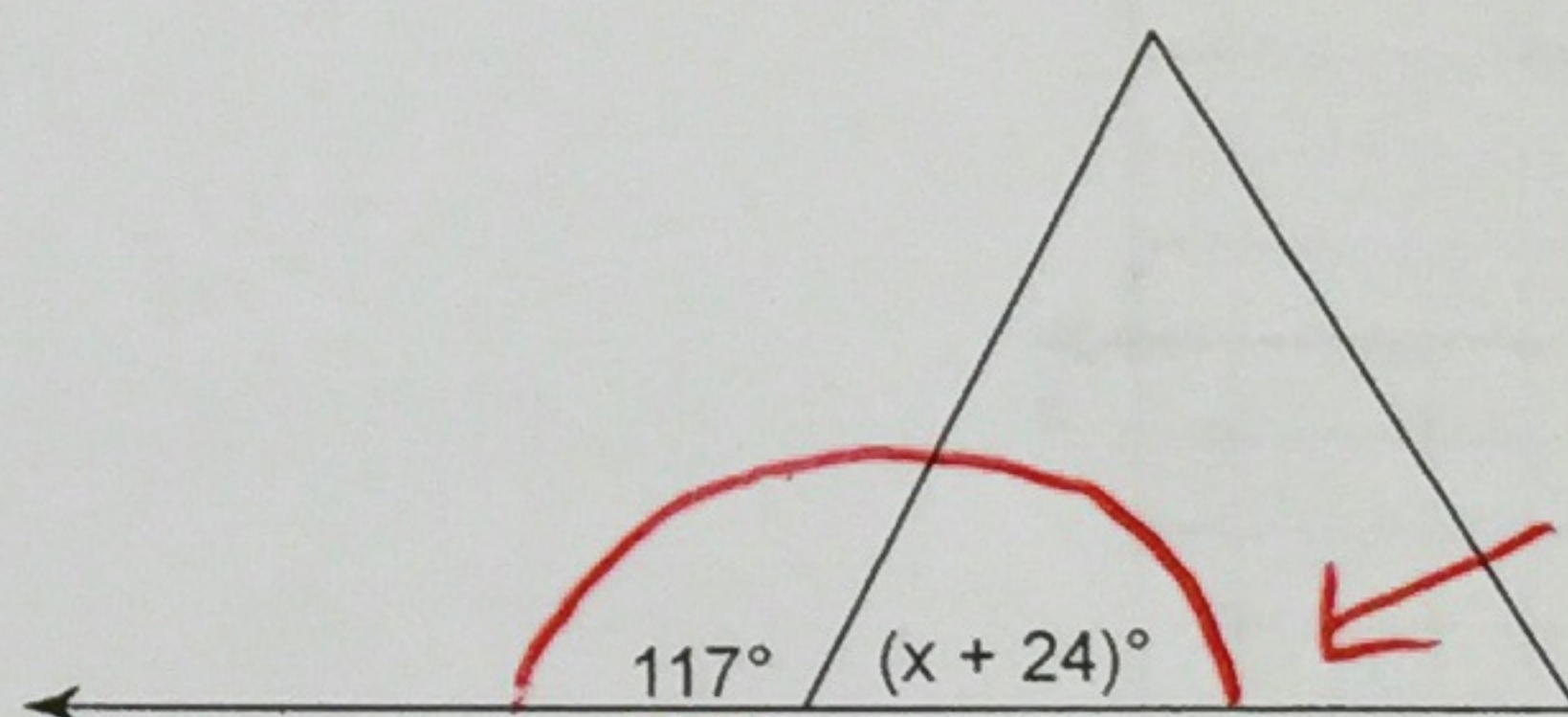
A) 43   B) 39
C) 52   D) 49

Simplify. Your answer should contain only positive exponents.

6) $4^4 \cdot 4^4$ *(handwritten):* add

A) 4^5 B) 4^8
C) 4^7 D) 4^6

(handwritten): multiply

7) $\frac{4^3}{4^4}$ *(handwritten):* subtract $4^{3-4} = 4^{-1}$

A) 4^2 B) 1
C) $\frac{1}{4^2}$ D) $\frac{1}{4}$

(handwritten): no negative exponents

8) $\left(3^3\right)^3$

A) 3^8 B) 3^9
C) 3^{12} D) 3^2

Find the coordinates of the vertices of each figure after the given transformation.

12) rotation 180° about the origin $(x, y)(-x, -y)$
$N(1, -1)$, $M(0, 3)$, $P(1, 3)$, $A(3, 1)$

(A) $N'(-1, 1)$, $M'(0, -3)$, $P'(-1, -3)$, $A'(-3, -1)$
B) $N'(1, 1)$, $M'(-3, 0)$, $P'(-3, 1)$, $A'(-1, 3)$
C) $N'(0, 0)$, $M'(-1, 4)$, $P'(0, 4)$, $A'(2, 2)$
D) $M'(0, 3)$, $P'(-1, 3)$, $A'(-3, 1)$, $N'(-1, -1)$

13) reflection across the y-axis $(x, y) \rightarrow (-x, y)$
$U(1, -3)$, $N(2, -2)$, $D(4, -4)$

A) $U'(1, -1)$, $N'(2, 0)$, $D'(4, -2)$
B) $N'(2, 2)$, $D'(4, 4)$, $U'(1, 3)$
C) $U'(3, 1)$, $N'(2, 2)$, $D'(4, 4)$
(D) $N'(-2, -2)$, $D'(-4, -4)$, $U'(-1, -3)$

14) translation: 1 unit right and 4 units down $(x, y) \rightarrow (x+1, y-4)$
$W(-5, 1)$, $G(-4, 3)$, $X(-4, 2)$, $R(-2, 1)$
$+1 -4$ $+1 -4$ $+1 -4$ $+1 -4$

(A) $W'(-4, -3)$, $G'(-3, -1)$, $X'(-3, -2)$, $R'(-1, -3)$
B) $W'(2, 0)$, $G'(3, 2)$, $X'(3, 1)$, $R'(5, 0)$
C) $W'(-1, -5)$, $G'(0, -3)$, $X'(0, -4)$, $R'(2, -5)$
D) $W'(1, 2)$, $G'(2, 4)$, $X'(2, 3)$, $R'(4, 2)$

Write each number in scientific notation.

15) 200 ← *only one # in front of decimal*
count # of places after decimal

(A) 2×10^2 B) 2×10^{-2}
C) 2×10^3 D) 2×10^{-1}

Write each number in standard notation.

+ exponent > move decimal right
− exponent > move decimal left

16) 5×10^{-3}

(A) 0.005   B) 0.5
C) 500   D) 0.05

**Simplify. Write each answer in scientific notation.**

17) $(2 \times 10^{-6})(6.91 \times 10^0)$ *• multiply reg #'s*
• add exponents

(A) 1.382×10^{-5}
B) 0.1382×10^{-5}
C) 2.894×10^{-7}
D) 0.1382×10^{-6}

13.82 × 10⁻⁶
− move decimal, change exponent
1.382 × 10⁻⁵

18) DIVIDE. $(5.1 \times 10^4) \div (3 \times 10^2)$ *• Divide reg #s*
• Subtract exponents

(A) 1.7×10^2 B) 1.7×10^1
C) 1.7×10^3 D) 17×10^2

1.7 × 10²
− decimal is in the right place

19) SOLVE. $(1.0975 \times 10^3) + (4.4925 \times 10^2)$ *− get common exponent*
> highest exponent

A) 1.54675×10^3 B) 1.54675×10^5
C) 5.59×10^5 D) 5.59×10^3

20) A car travels at a rate of 6×10^1 miles per hour for 1.5×10^1 hours. How far did the car travel? Write your answer in both standard and scientific notation form. *multiply $(6 \times 10^1)(1.5 \times 10^1)$*
sci → 9×10^2 standard → 900

21) Flora has to make a triangular frame out of three metal bars. The bars are 12, 13, and 25 inches long. Can she use these bars to make a triangle? Explain your answer. *$12 + 13 > 25$ ← not true*
remember → 2 short > long   *so no, it's not a △*

22) Benny says that he designed a logo by drawing a triangle, rotating it 180°, and then reflecting it across the y-axis. He says both of the triangles are similar to each other. His sister says the triangles are actually congruent. Who is right? How do you know? *His sister because the △ wasn't dilated.*

Graph the image of the figure using the transformation given.
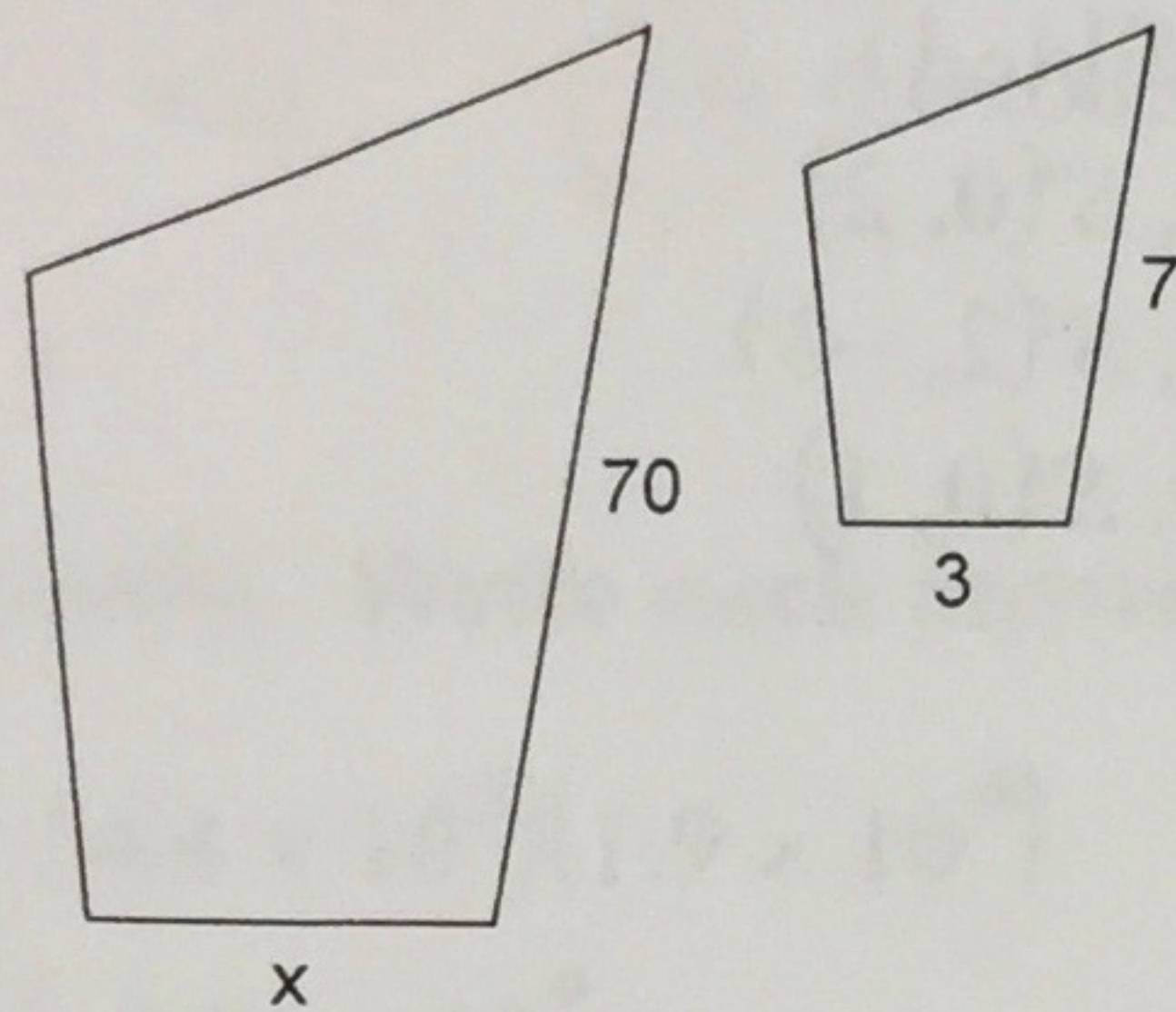
9) reflection across the x-axis

turn it the opp way

over x
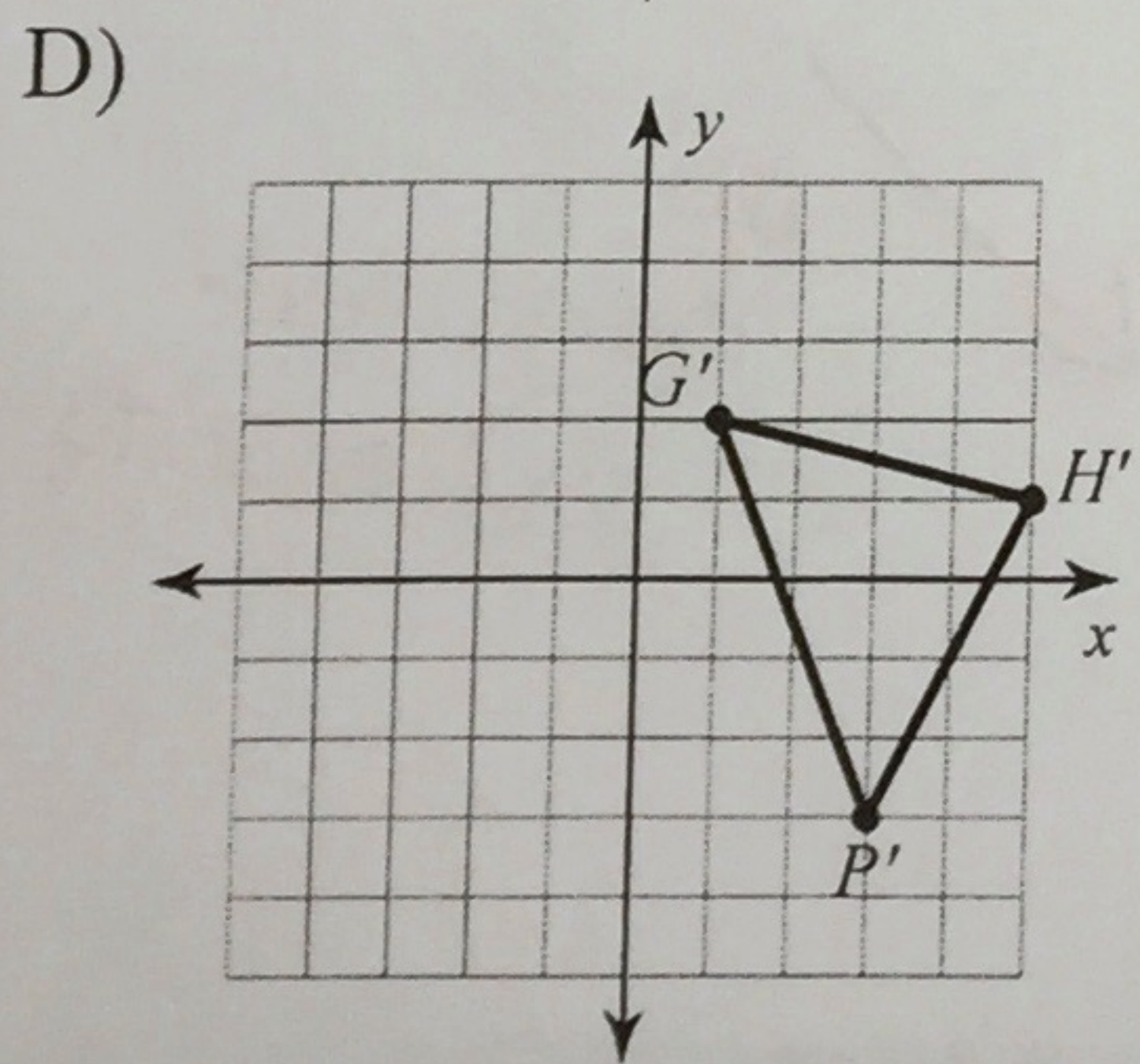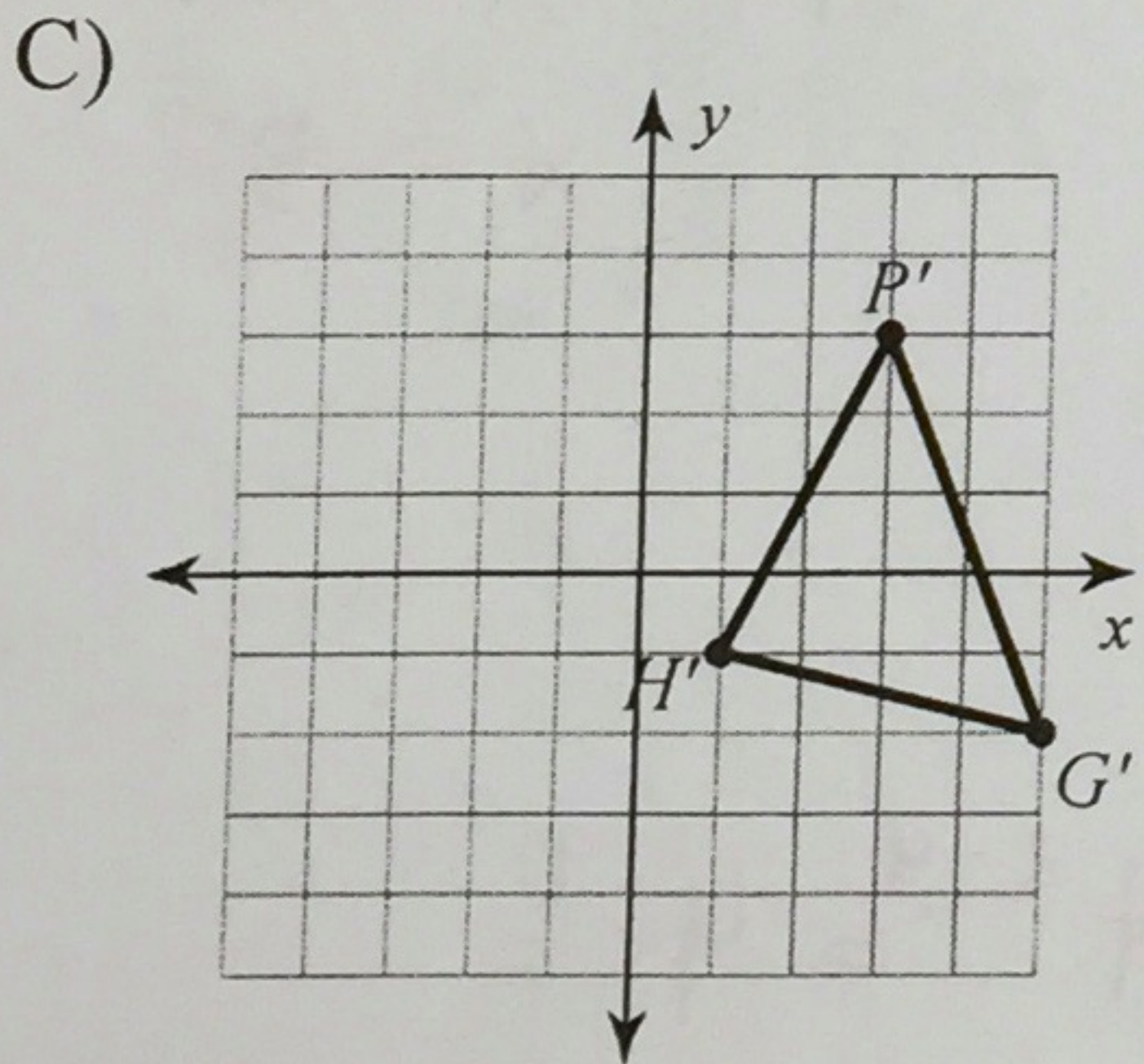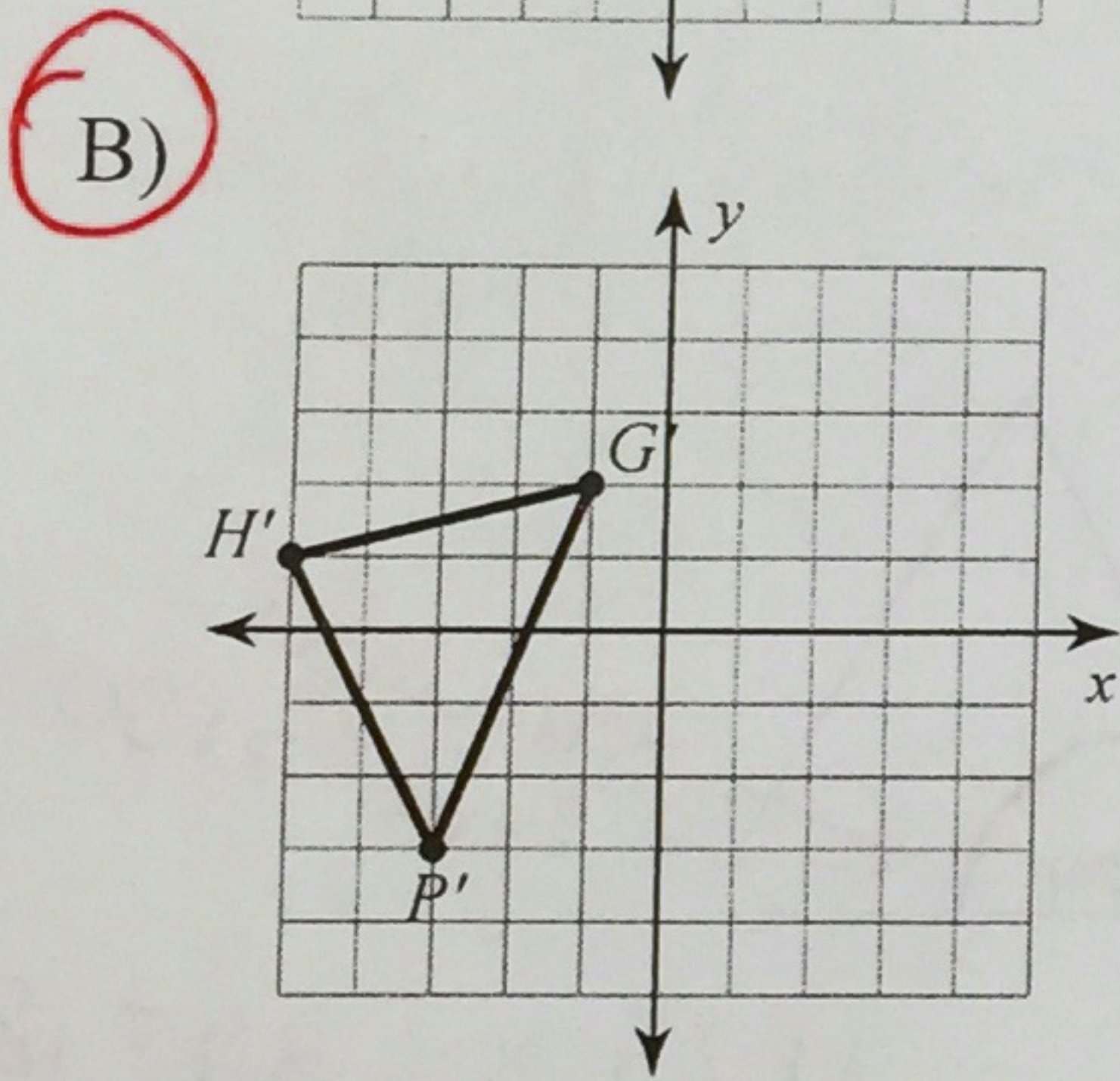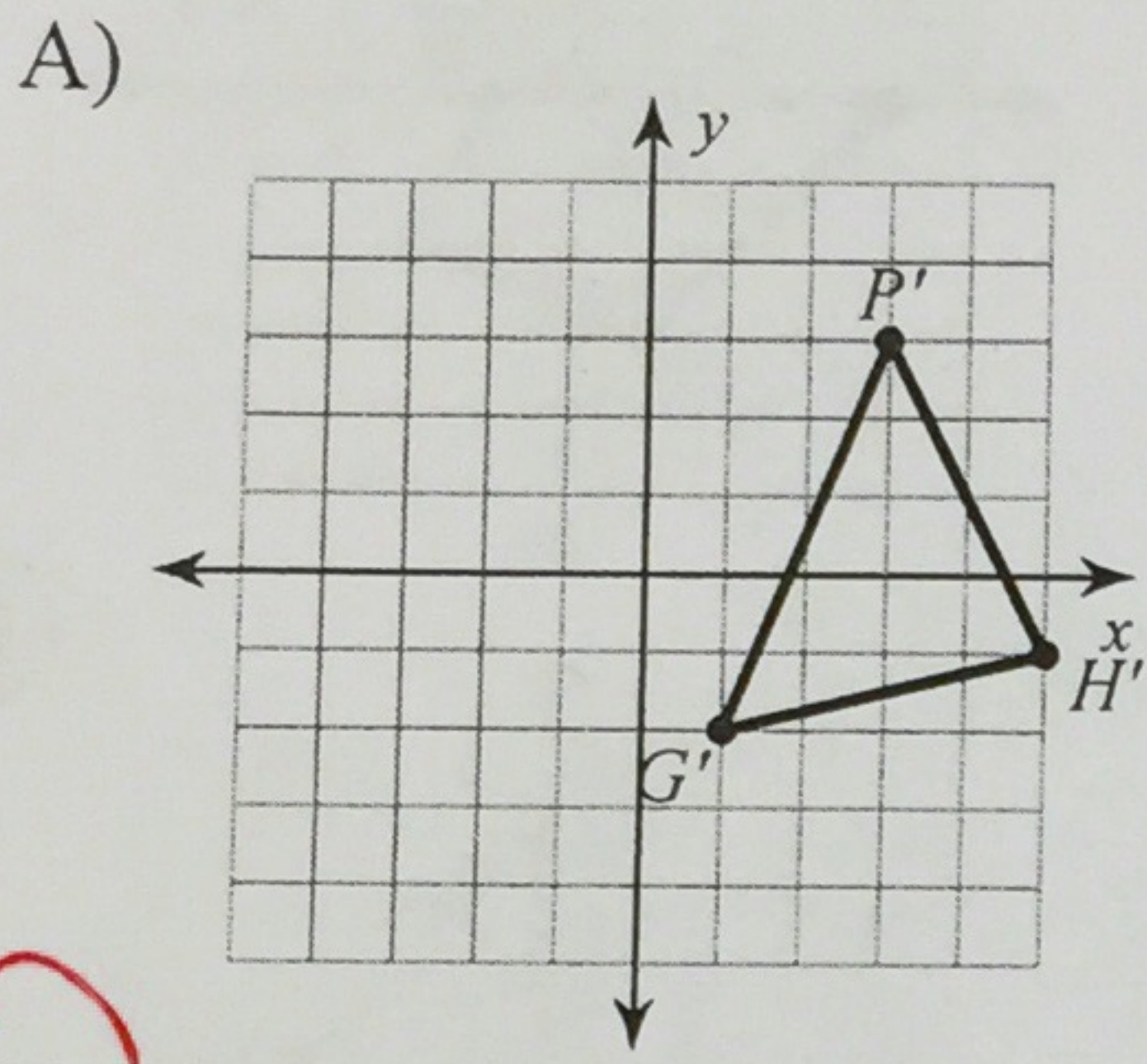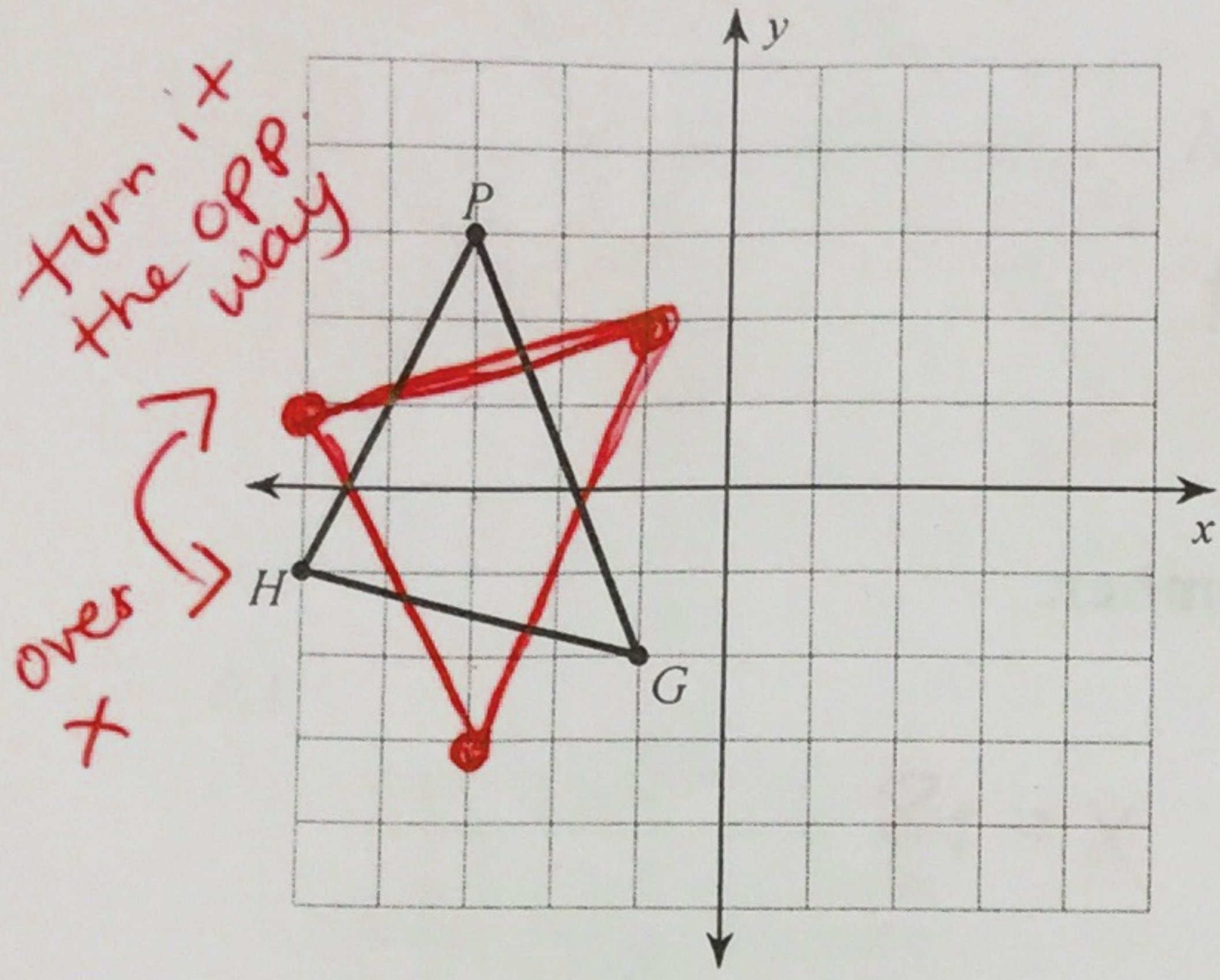
10) translation: 5 units right and 1 unit down
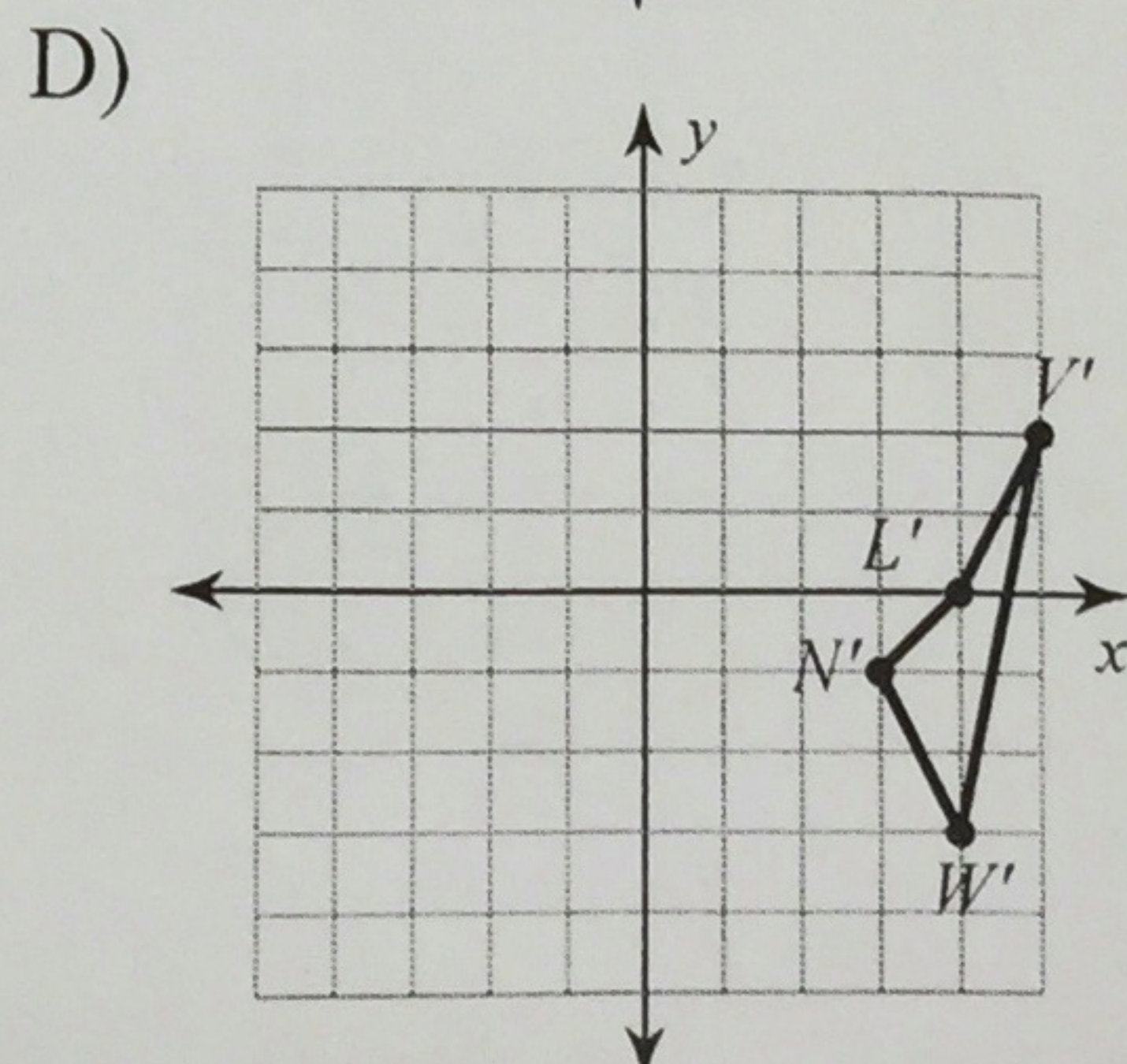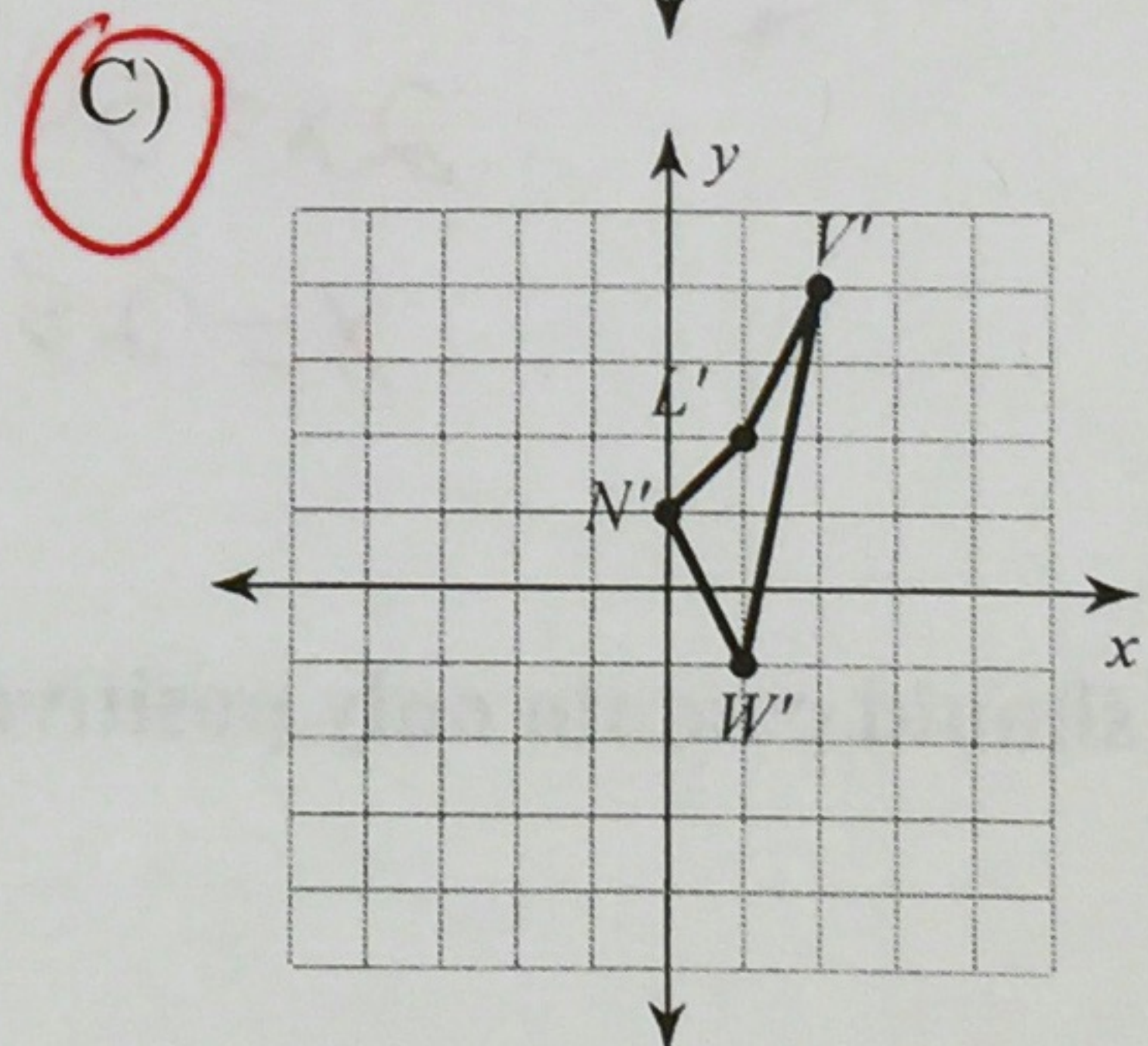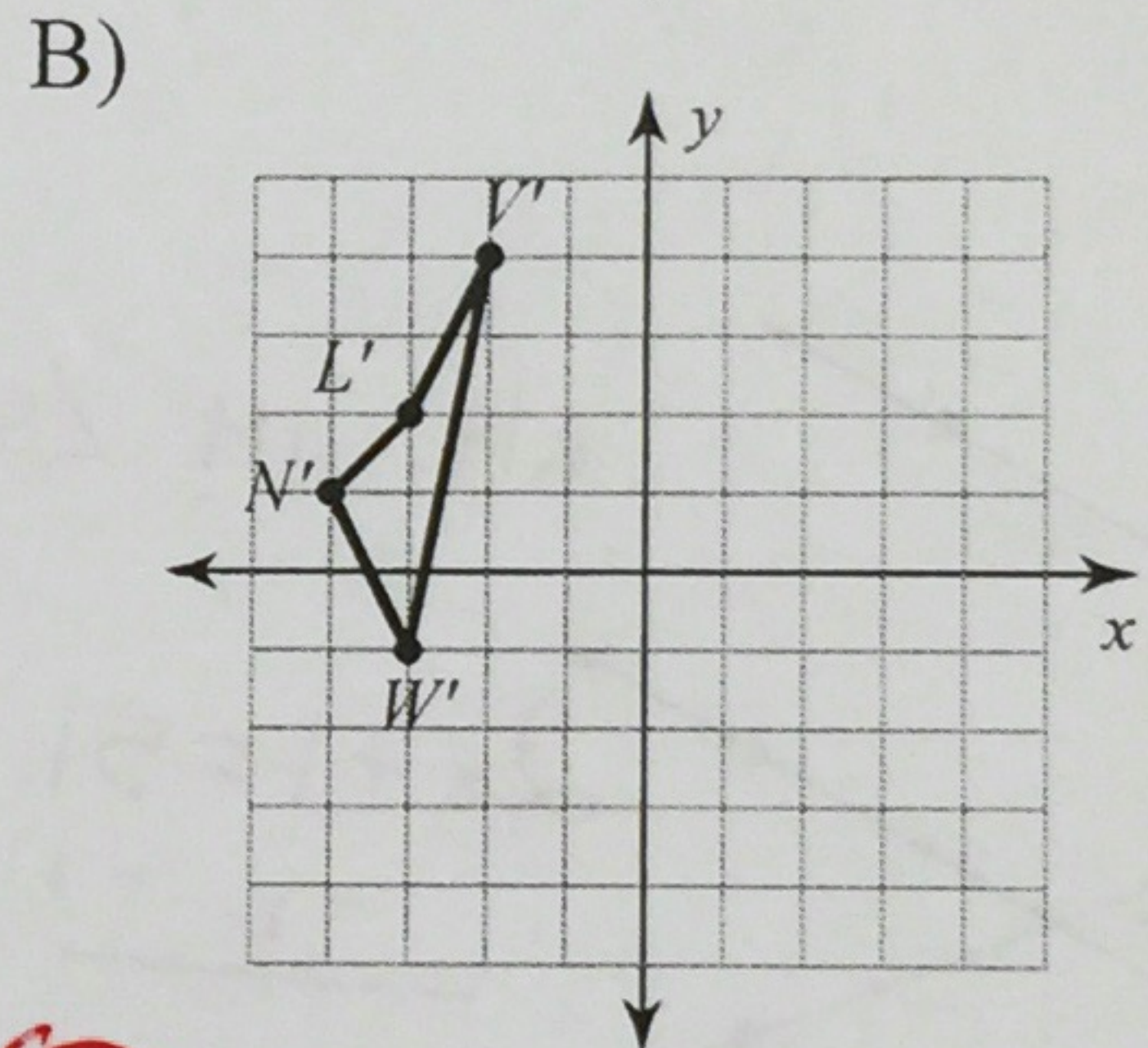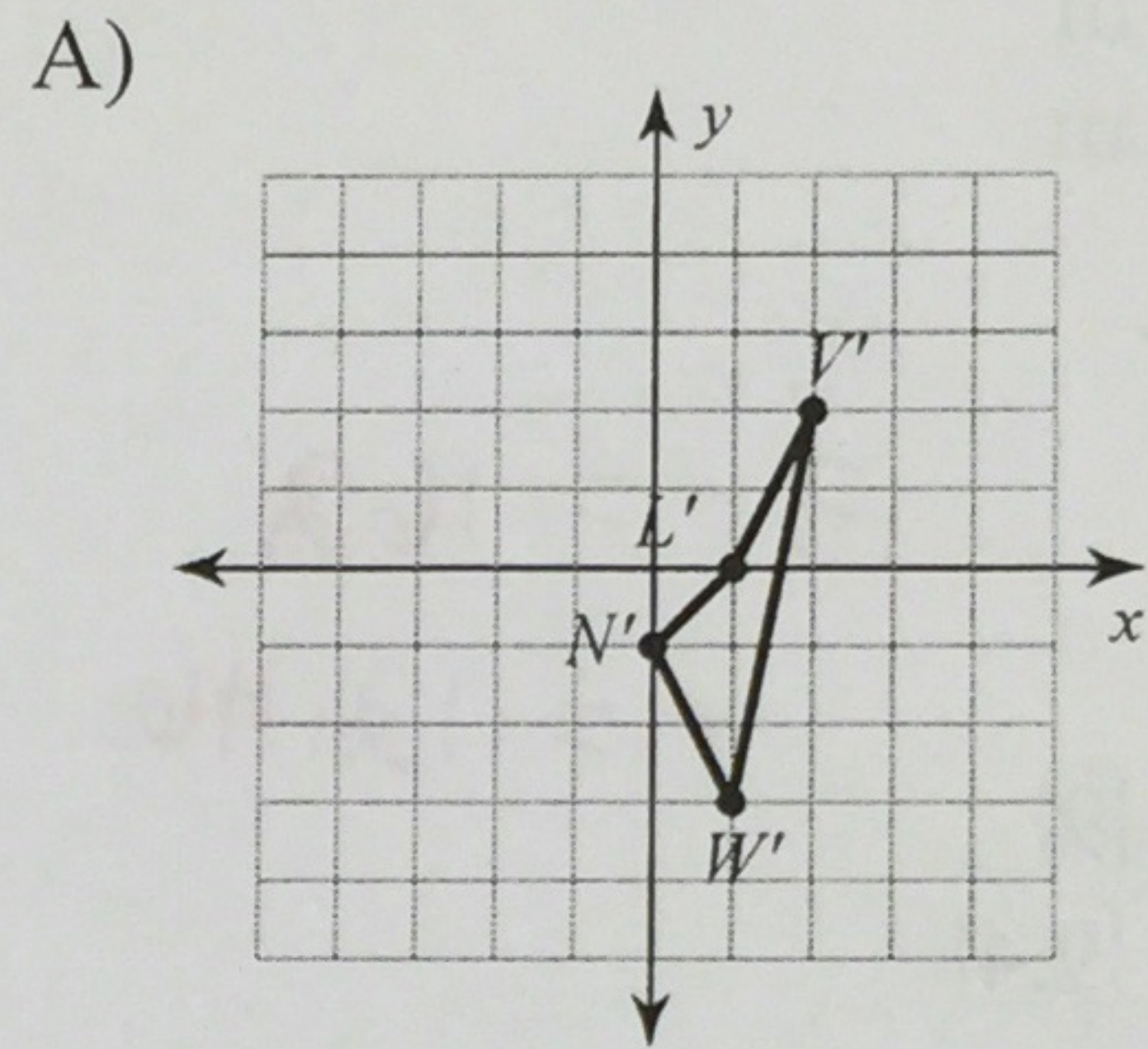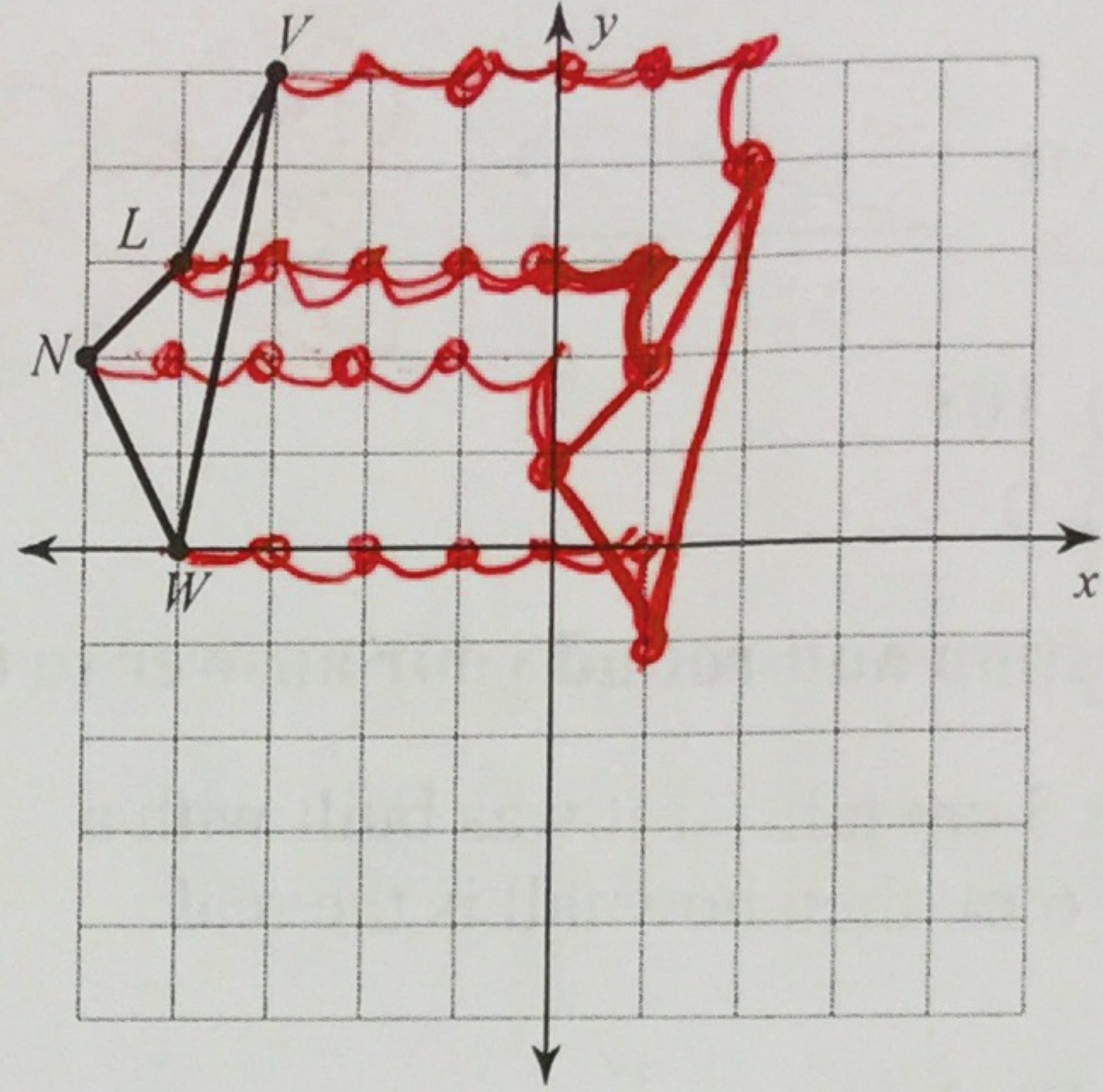
A)

B)

C)

D)

A)

B)

C)

D)

Each pair of figures is similar. Find the missing side. (MCC8.G.4)
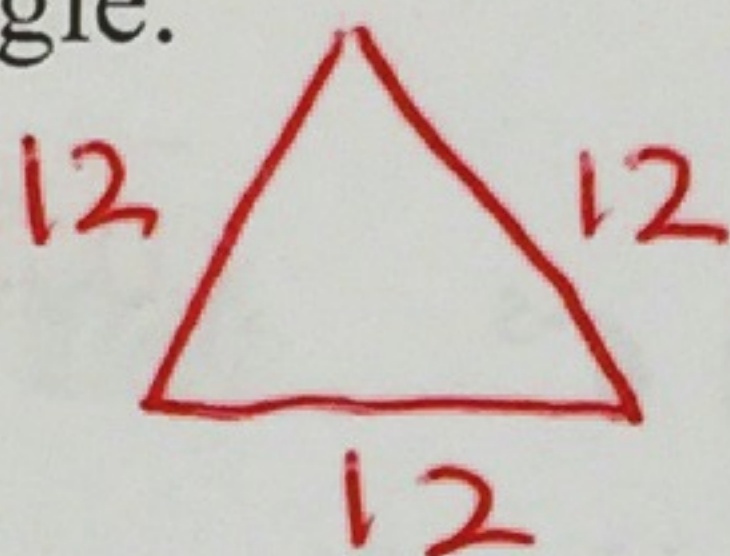
1)

7

70

3

x

A) 50   B) 3
C) 500   (D) 30

Solve. (MCC8.G.3)

← all sides equal

2) The perimeter of an equilateral triangle is 36 cm. If the triangle is dilated by a scale factor of .75, what is the length of the side of the new triangle.
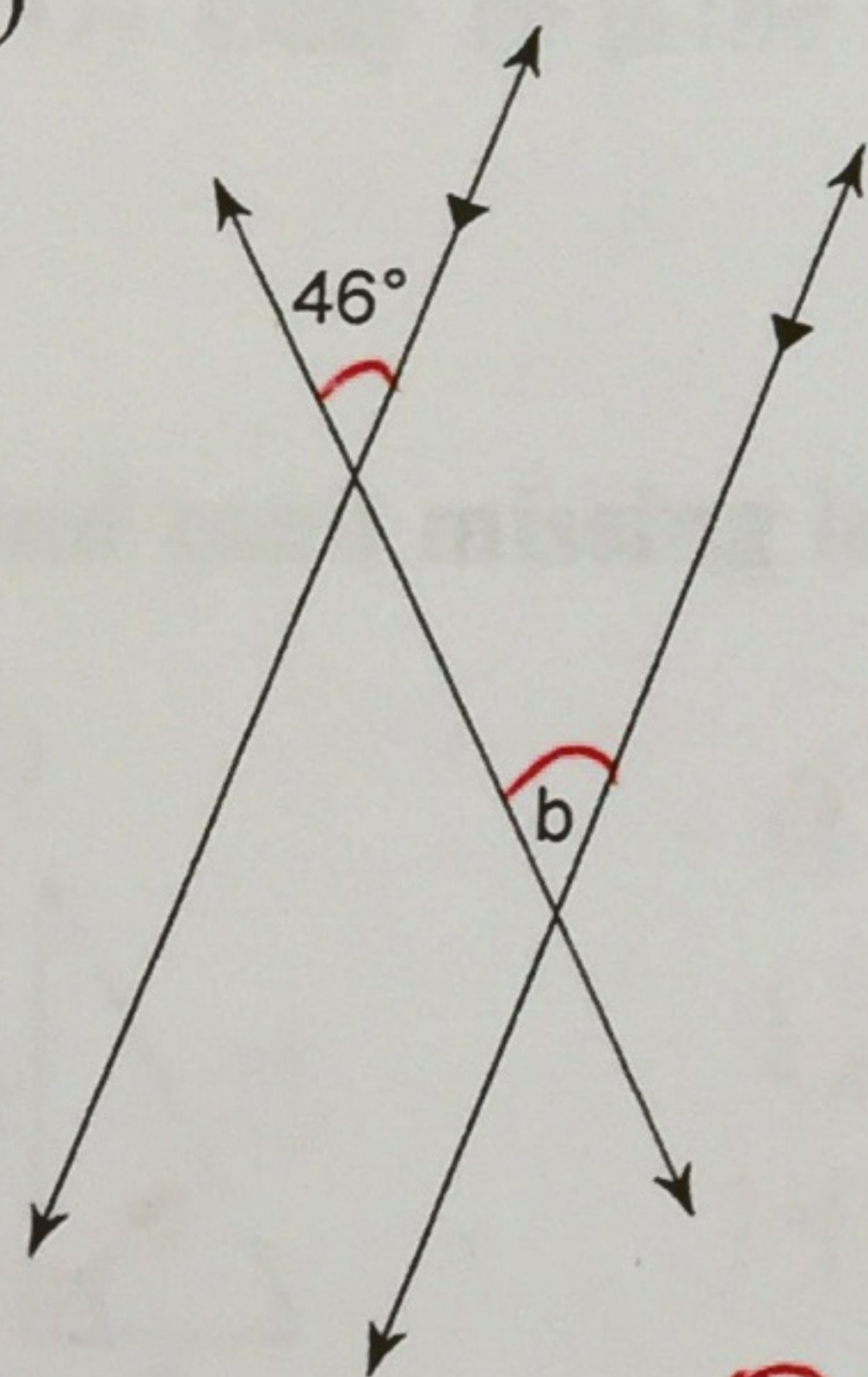
A) 3   B) 4
(C) 9   D) 12

12 ⟋⟍ 12

12

12 x .75 = 9

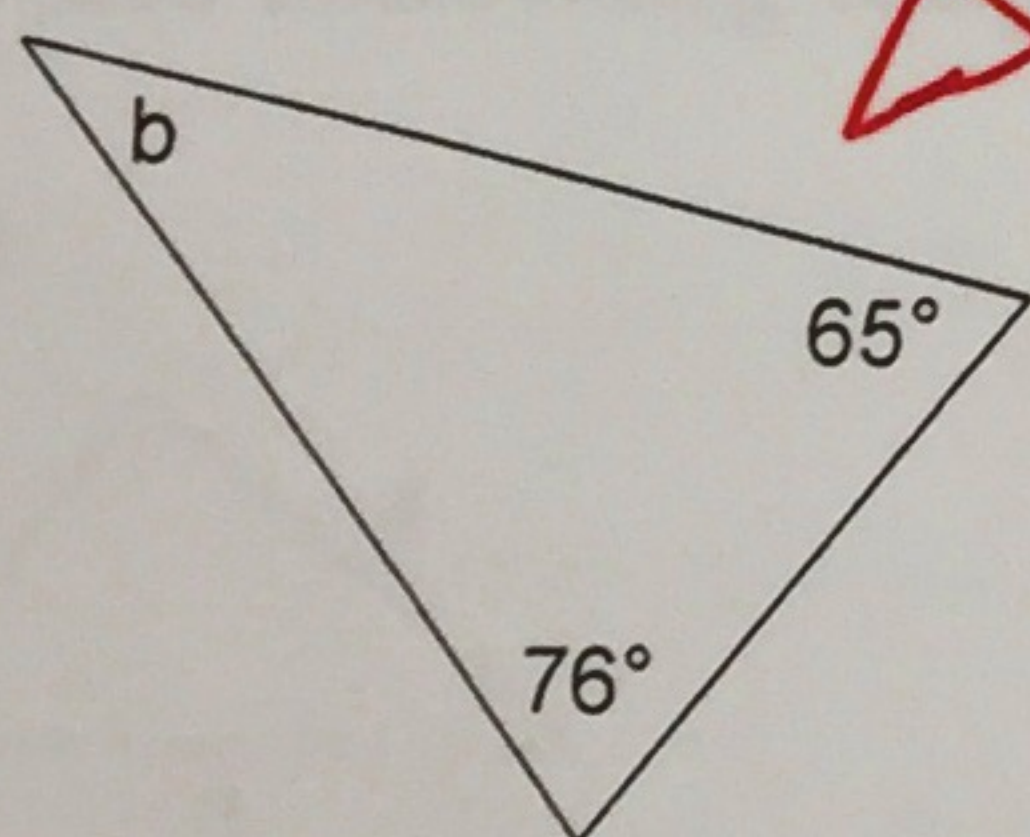**Find the measure of angle b. (MCC8.G.5)**

3)

46°

b

Corresponding ∠s
are ≅

A) 96°   (B) 46°
C) 134°   D) 159°

Find the measure of angle b.(MCC8.G.5)

4)

△'s = 180°

b

65°

76°

180 - 65 - 76

A) 33°   B) 26°
(C) 39°   D) 31°

11) rotation 90° counterclockwise about the origin

$90 cc \Rightarrow (x,y) \Rightarrow (-y, x)$

(handwritten annotations on graph:)
$(-2,-2)$
$(-2,2)$
$(1,3) \rightarrow (-3,1)$
$(7,0)$
$(0,1)$
$(4,0)$
$(0,4)$

L Y Q B

A)

B) (circled)
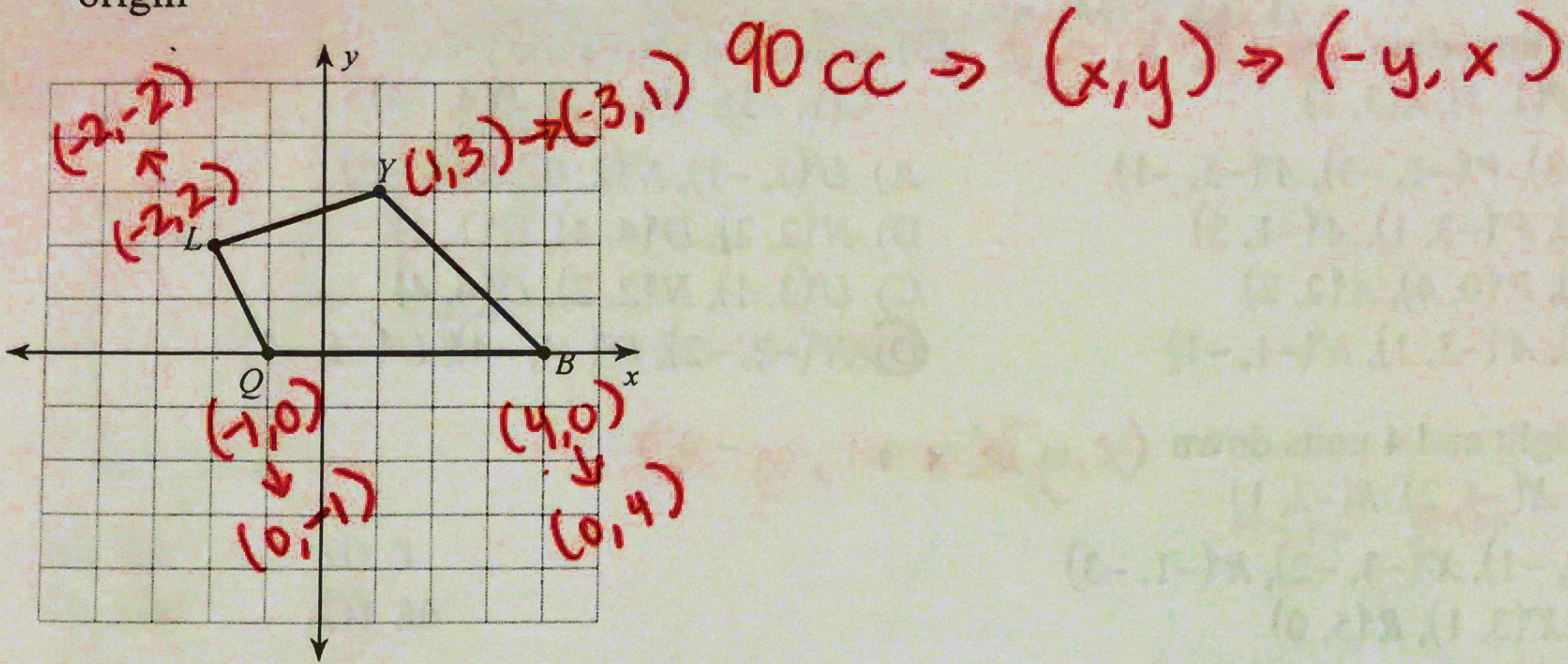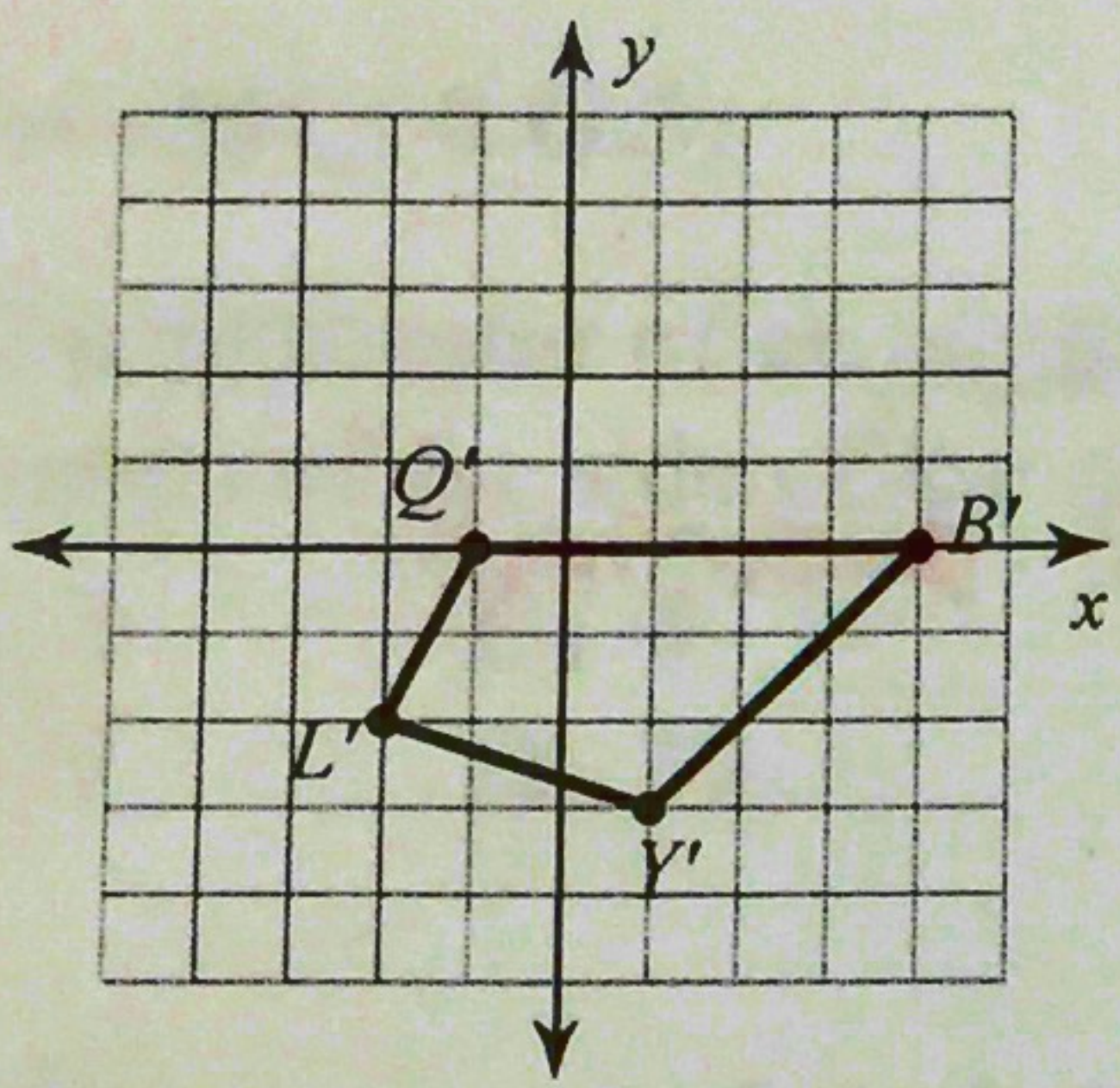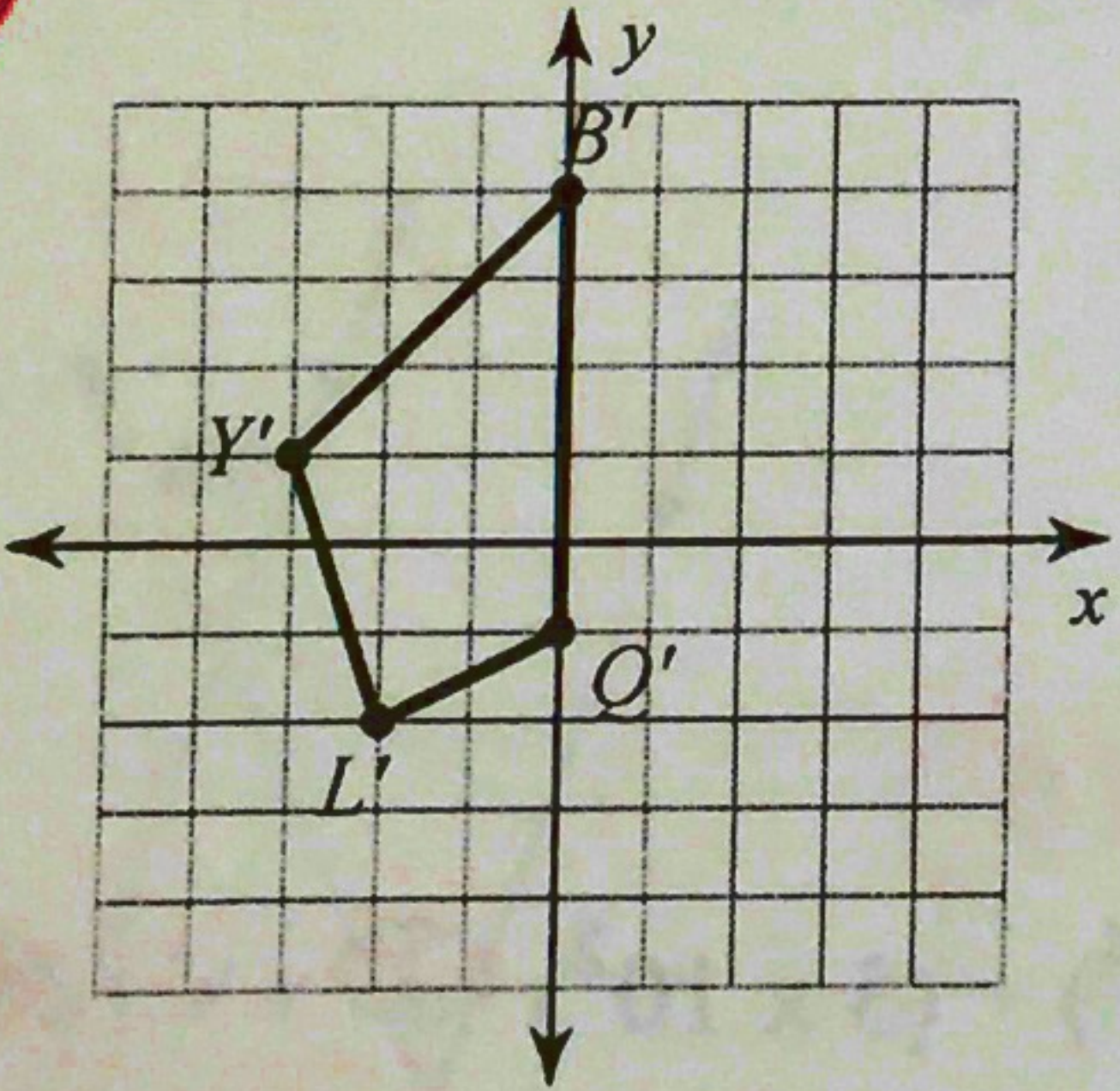
C)

D)

Find the coordinates of the vertices of each figure after the given transformation. (MCC8.G.3)
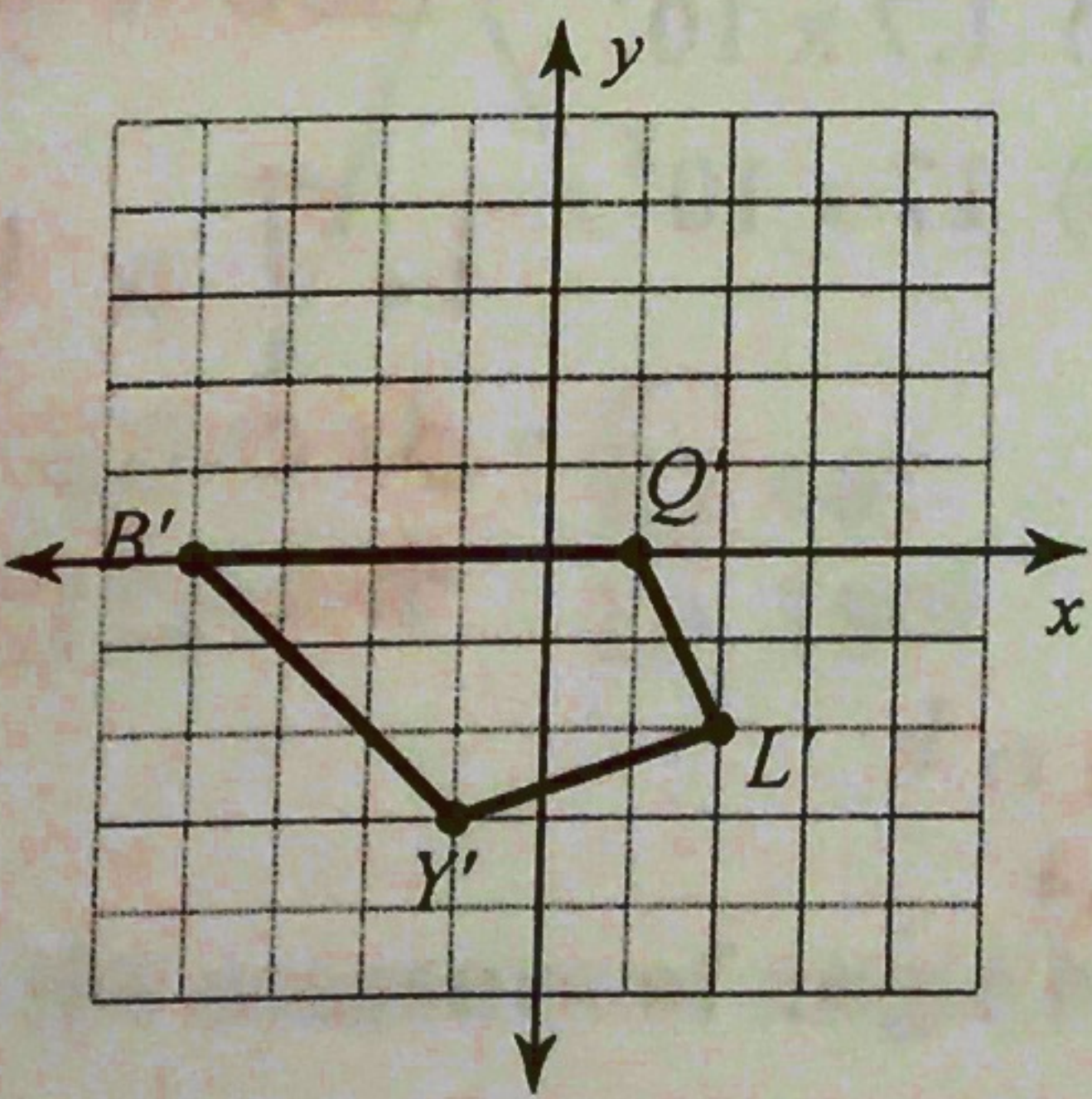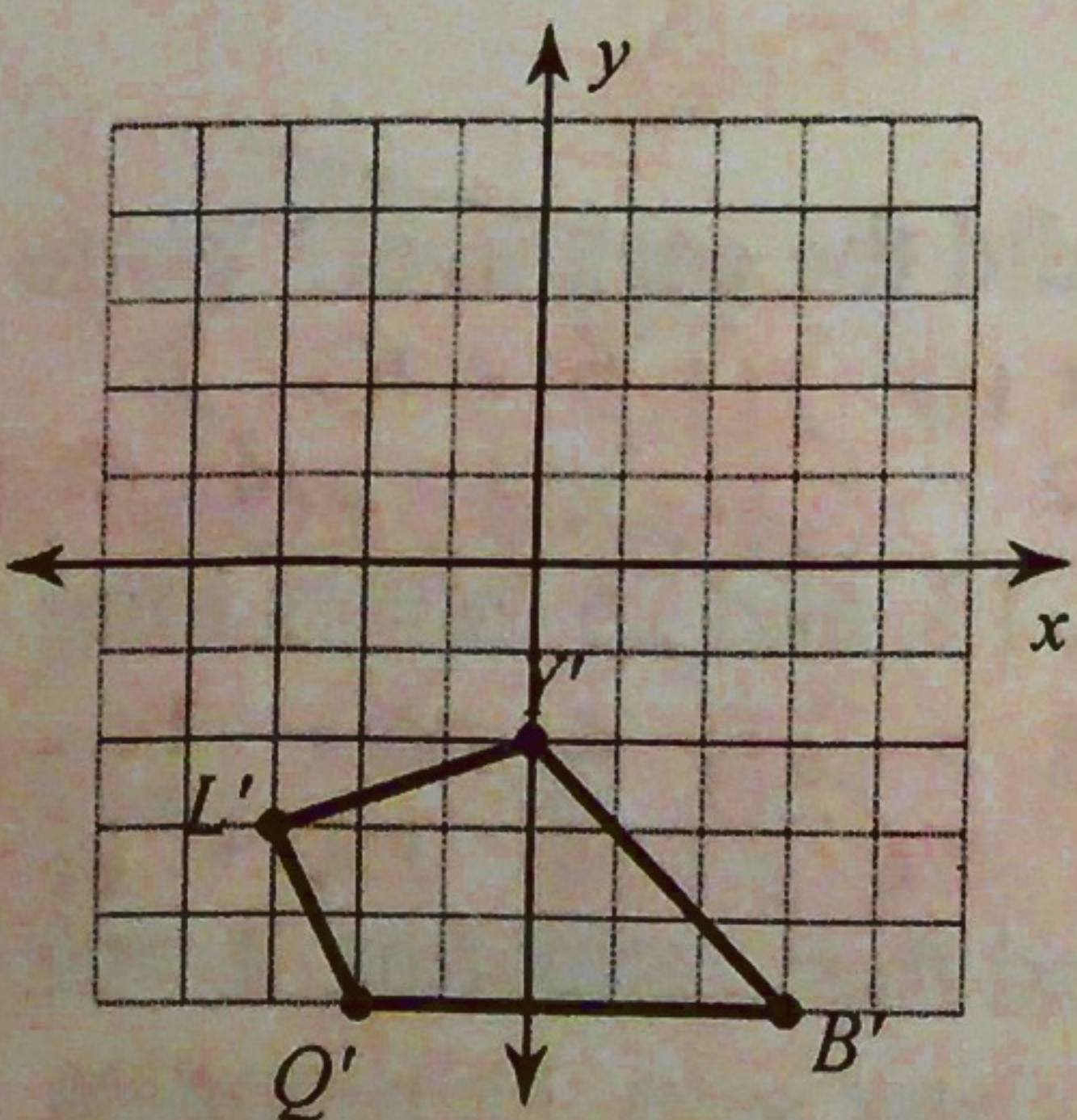
5) reflection across the x-axis $(x, y) \rightarrow (x, -y)$
   $Y(-3, -4), V(0, -2), I(2, -5)$

   A) $Y'(4, -3), V'(2, 0), I'(5, 2)$
   B) $V'(0, 2), I'(2, 5), Y'(-3, 4)$
   C) $Y'(-4, -3), V'(-1, -1), I'(1, -4)$
   D) $V'(0, -2), I'(-2, -5), Y'(3, -4)$

6) translation: 1 unit right and 4 units up
   $Z(-4, -4), C(-1, 0), S(0, -3)$ $(x, y) \rightarrow (x+1, y+4)$

   A) $Z'(-3, 0), C'(0, 4), S'(1, 1)$
   B) $Z'(-4, 1), C'(-1, 5), S'(0, 2)$
   C) $Z'(-2, -4), C'(1, 0), S'(2, -3)$
   D) $Z'(-4, 0), C'(-1, 4), S'(0, 1)$

7) rotation 180° about the origin $(x, y) \rightarrow (-x, -y)$
   $J(2, 1), P(1, 3), T(5, 1)$

   A) $J'(1, -2), P'(3, -1), T'(1, -5)$
   B) $P'(1, -3), T'(5, -1), J'(2, -1)$
   C) $J'(-2, -1), P'(-1, -3), T'(-5, -1)$
   D) $J'(-1, 2), P'(-3, 1), T'(-1, 5)$

Simplify. (MCC8.EE.1)

8) 10^{-5}

   A) 0.00001   B) 100000
   C) 0.00005   D) -50

9) 6^{-5} *just flip*

   A) -30   B) $1/6^5$
   C) 0.00006   D) -7776

Simplify. Your answer should contain only positive exponents. (MCC8.EE.1)

10) $6^1 \cdot 6^4$ *add*

   A) 6^8 B) 6^4
   C) 6^6 D) 6^5

11) $\dfrac{5^2}{5^4}$ $5^{2-4} = 5^{-2}$

   A) $\dfrac{1}{5^2}$ B) 1

   C) $\dfrac{1}{5^3}$ D) 5

12) $\left(5^2\right)^3$ *mult.*

   A) 5^6 B) 5^{16}
   C) 5^8 D) 5^9

Write each number in scientific notation. (MCC8.EE.3)

13) 0.0000416   4.16
    small #'s = neg. exp.

   A) $4.16 \cdot 10^6$ B) $4.16 \cdot 10^{-6}$
   C) $0.416 \cdot 10^6$ D) $4.16 \cdot 10^{-5}$

Write each number in standard notation. (MCC8.EE.3)

14) 8.5×10^{-4}
  A) 85
  B) 8.5
  C) 850
  D) 0.00085 ⟵ *(circled)*

Simplify. Write each answer in scientific notation. (MCC8.EE.4)

15) $(4.4 \times 10^5)(1.9 \times 10^4)$
  A) 8.36×10^9 ⟵ *(circled)*
  B) 2.316×10^1
  C) 2.316×10^{-1}
  D) 8.36×10^8

16) $(2.25 \times 10^{-5}) + (5.5 \times 10^{-7})$
  A) 2.305×10^{-12}
  B) 7.75×10^{-12}
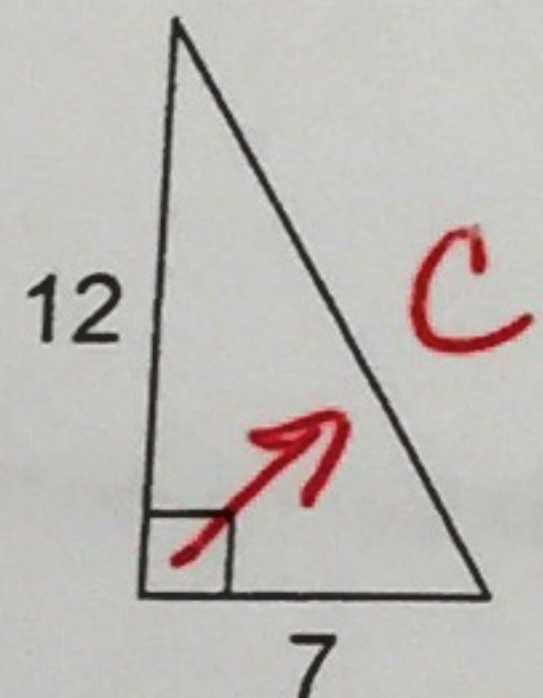 C) 7.75×10^{-2}
  D) 2.305×10^{-5} ⟵ *(circled)*

Solve. (MCC8.EE.2)

17) What are the two square roots of 256?
  A) 16, -16 ⟵ *(circled)*
  B) 128, -128
  C) 128, 2
  D) Only 16 is the square root of 256

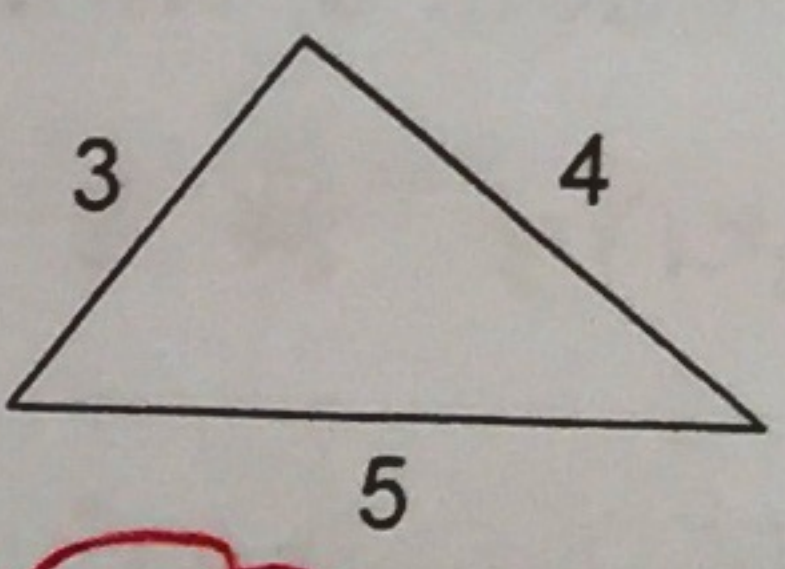**Find each missing length to the nearest tenth. (MCC8.G.7)**

18)

$a^2 + b^2 = c^2$
$12^2 + 7^2 = c^2$
$144 + 49 = c^2$

  A) 12.7   B) 19
  C) 193.2   D) 13.9 ⟵ *(circled)*

Remember to use $\boxed{\triangle\triangleright \tilde{x}}$ *button*

Do the following lengths form a right triangle? (MCC8.EE.6)

19)

  A) Yes ⟵ *(circled)*   B) No

↑ plug into Pythagorean Theorem
$3 + 4 > 5$
yes, its a triangle

$3^2 + 4^2 = 5^2$
$9 + 16 = 25$
Yes, its a right △

-3-