Geometry                                   Mathematician: _____
Unit 2: Transformations                                        Period:_____
2.2C Reflections

## LEVEL: EMERGING

| 1) The axis of symmetry of a figure is a... | 2) How many different axes of symmetry does an isosceles triangle have? | 3) How many different axes of symmetry are there for a square? |
|---|---|---|
| (a) Value<br>(b) Point<br>(c) Line<br>(d) Plane | (a) 0<br>(b) 1<br>(c) 2<br>(d) 3 | (a) 0<br>(b) 1<br>(c) 2<br>(d) 4 |

| 4) What are the coordinates of the reflection of the point (-9,6) over the line $y = 3$? | 5) What are the coordinates of the reflection of the point (2,-6) over the $y - axis$? | 6) What are the coordinates of the reflection of the point (-1,-4) over the line $y = 0$? |
|---|---|---|
| $x$ −coordinate: _____<br><br>$y$ −coordinate: _____<br><br>Sum: _____ | $x$ −coordinate: _____<br><br>$y$ −coordinate: _____<br><br>Sum: _____ | $x$ −coordinate: _____<br><br>$y$ −coordinate: _____<br><br>Sum: _____ |

## LEVEL: PROFICIENT

Directions:  Reflect the pre-image over the given line of reflection to find the coordinates of the image.

7) a) Over the line $x = -1$.

| Pre-Image | Image |
|---|---|
| 1 (      ) | 1' (        ) |
| 2 (      ) | 2' (        ) |
| 3 (      ) | 3' (        ) |
| 4 (      ) | 4' (        ) |
| 5 (      ) | 5' (        ) |

b)  What do you notice about the corresponding coordinates of the pre-image and the image? Write your observations here.
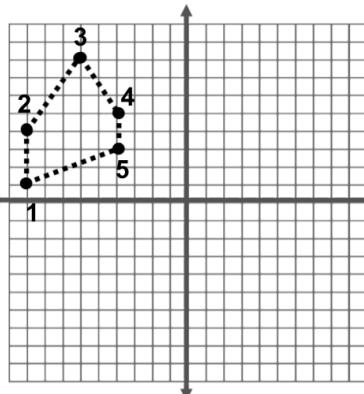
8) a) Over the line $y = 3$.

| Pre-Image | Image |
|---|---|
| 1 (      ) | 1' (        ) |
| 2 (      ) | 2' (        ) |
| 3 (      ) | 3' (        ) |
| 4 (      ) | 4' (        ) |
| 5 (      ) | 5' (        ) |
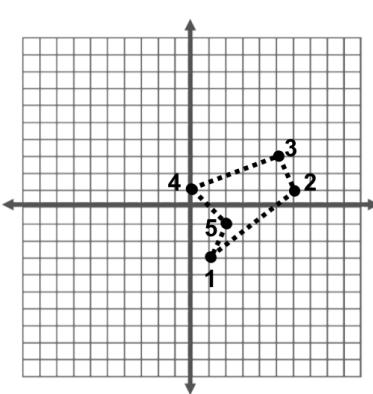
b)  What do you notice about the corresponding coordinates of the pre-image and the image? Write your observations here.

Directions: Identify the coordinates of the image after the reflection. Then graph the reflection of the figure.

9) $x - axis$



A'

B'

C'

10) $y - axis$



A'

B'

C'

D'
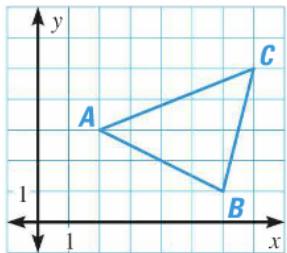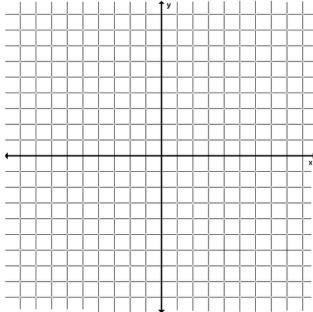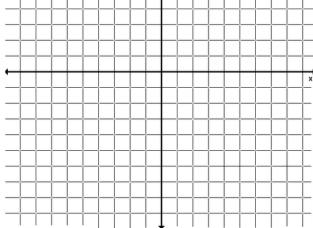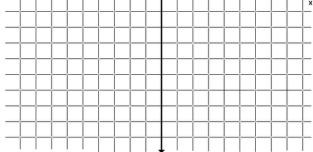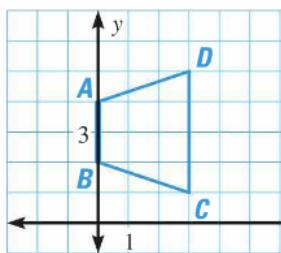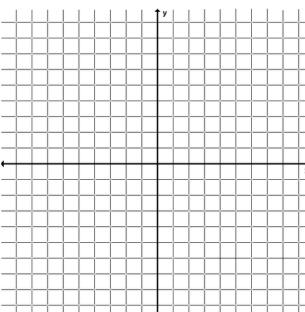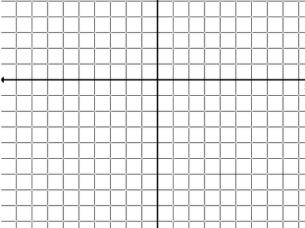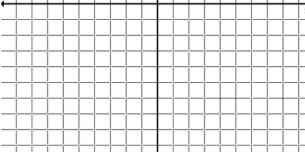
11) $y = 2$
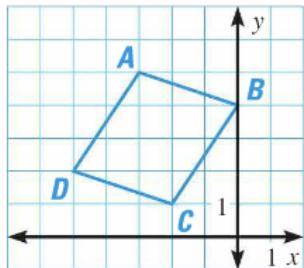


A'
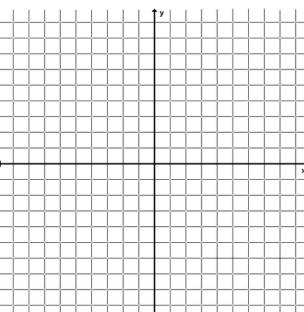
B'
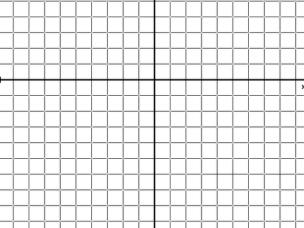
C'
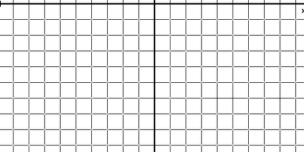
D'

12) What is the axis of symmetry for the image and pre-image of the following figure?
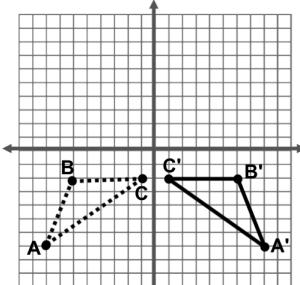


Axis of symmetry: _____

13) What is the axis of symmetry for the image and pre-image of the following figure?
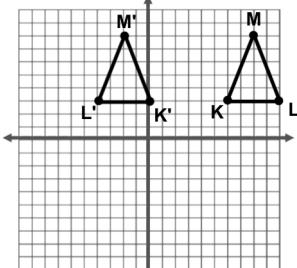


Axis of symmetry: _____

14) What is the axis of symmetry for the image and pre-image of the following figure?
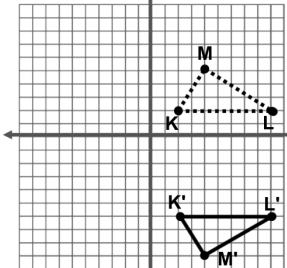


Axis of symmetry: _____

15) A line segment has endpoints A (4, -1) and B (5, -4). The line segment is reflected over x = 1. Find the sum of the x- and y-coordinate of A' and B'.
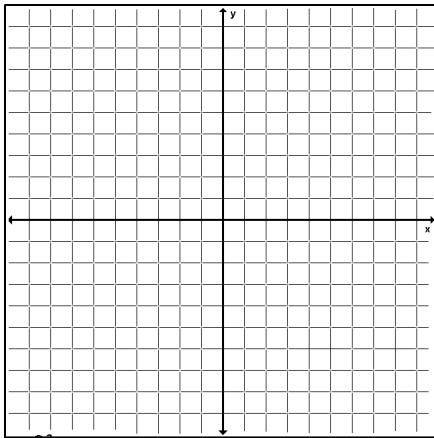


16) A line segment has endpoints A (-3, 1) and B (0, 4). The line segment is reflected over y = -2. Find the sum of the x- and y-coordinate of A' and B'.



| A (4, -1) | | B(5, -4) | |
|---|---|---|---|
| A' (   ,   ) | | B' (   ,   ) | |
| Sum of A' = | | Sum of B' = | |

| A (-3, 1) | | B(0, 4) | |
|---|---|---|---|
| A' (   ,   ) | | B' (   ,   ) | |
| Product of A' = | | Product of B' = | |
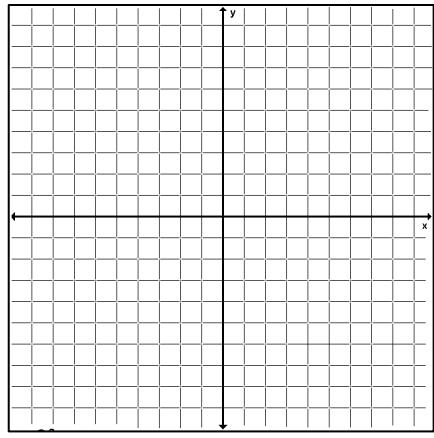
# Unit 2.2C Worksheet Answers

1. C
2. D
3. D
4. x-coordinate = -9 , y = coordinate = 0, Sum = -9
5. x-coordinate = -2, y = coordinate = -6, Sum = -8
6. x-coordinate = -1, y = coordinate = 4, Sum = 3
7.
    a. Pre-image: 1(-9,1), 2(-9,4), 3(-6,8), 4(-4,5), 5(-4,3)
       Image: 1'(7,1), 2'(7,4), 3'(4,8), 4'(2,5), 5'(2,3)
    b. All y's stay the same
8.
    a. Pre-image: 1(1,-3), 2(6,1), 3(5,3), 4(0,1), 5(2,-1)
       Image: 1'(1,9), 2'(6,5), 3'(5,3), 4'(0,5), 5'(2,7)
    b.  All x's stay the same

9. A(2,3),  B(6,1),  C(7,5)  →    A'(2,-3), B'(6,-1), C'(7,-5)
10. A(0,4),  B(0,2),  C(3,1),  D(3,5)  →    A'(0,4), B'(0,2), C'(-3,1), D'(-3,5)
11. A(-3,5),  B(0,4),  C(-2,1), D(-5,2)  →    A'(-3,-1), B'(0,0), C'(-2,3), D'(-5,2)
12. y-axis or $x = 0$
13. $x = 3$
14. $y = -2$
15. A'(-2,-1), B'(-3,-4)  →  Sum A' = -3, Sum B' = -7
16. A'(-3,-5), B'(0,-8)  →  Sum A' = -8, Sum B' = -8