Name _____ Date _____

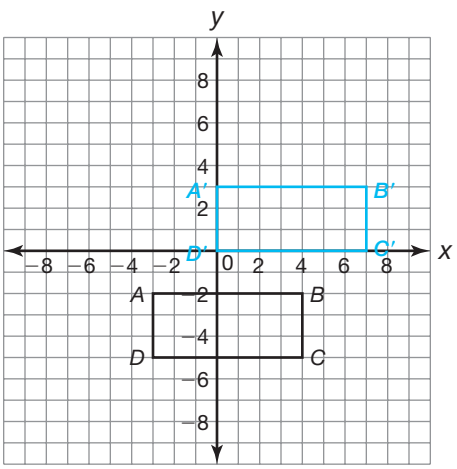
Transforming to a New Level!

Using Transformations to Determine Perimeter and Area

Problem Set

Translate each given rectangle or square such that one vertex of the image is located at the origin and label the vertices of the image. Calculate the perimeter and area of the image.

1. Rectangle *ABCD*



$A'B' = 7, B'C' = 3, C'D' = 7, A'D' = 3$

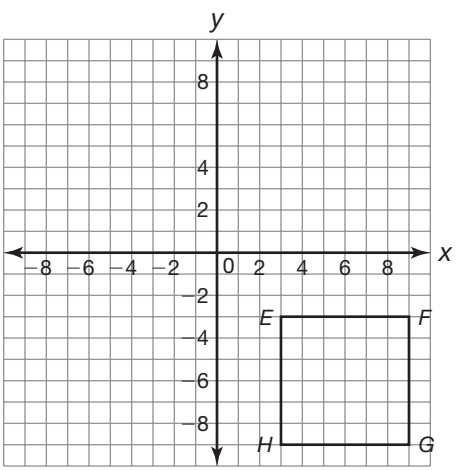
Perimeter of $A'B'C'D' = A'B' + B'C' + C'D' + A'D'$
$= 7 + 3 + 7 + 3$
$= 20$

The perimeter of $A'B'C'D'$ is 20 units.

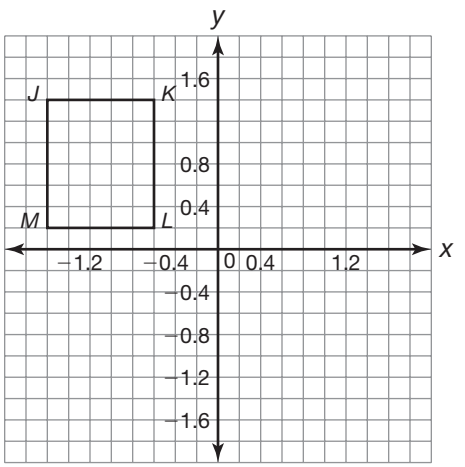
Area of $A'B'C'D' = bh$
$= 7(3)$
$= 21$

The area of $A'B'C'D'$ is 21 square units.

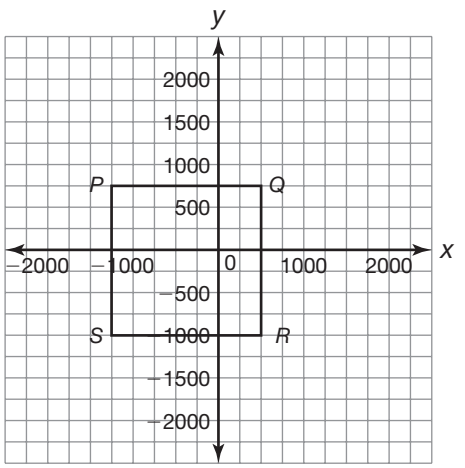
2. Square *EFGH*



3. Rectangle *JKLM*

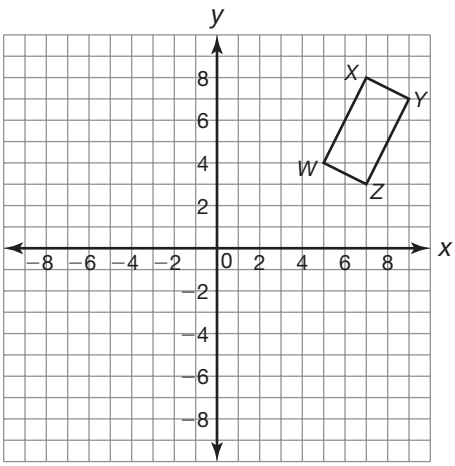


4. Square *PQRS*

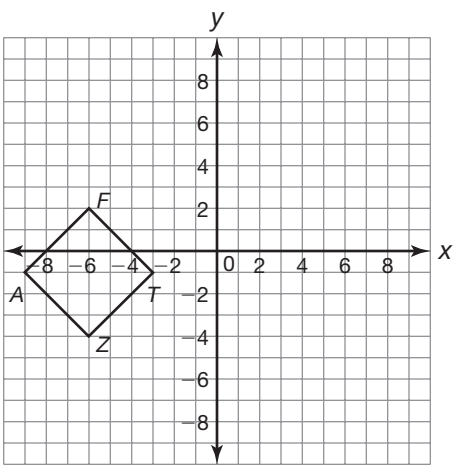


Name _____ Date _____

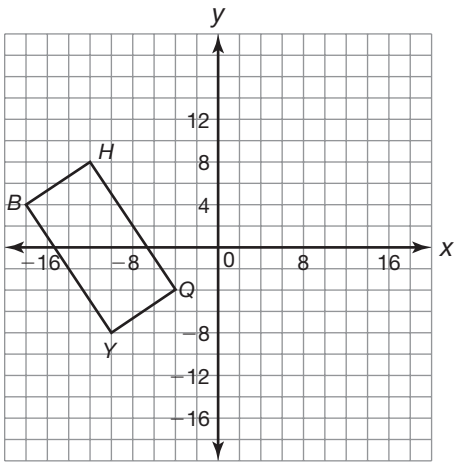
5. Rectangle *WXYZ*



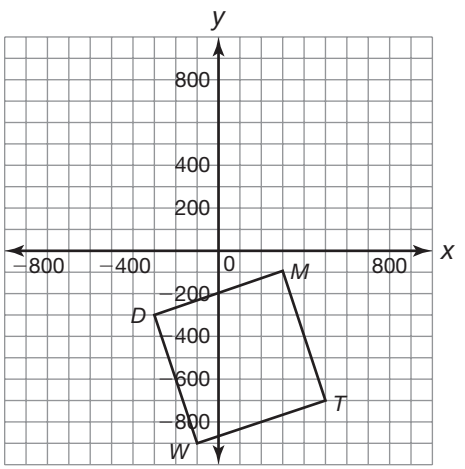
6. Square *AFTZ*



7. Rectangle *BHQY*



8. Square *DMTW*



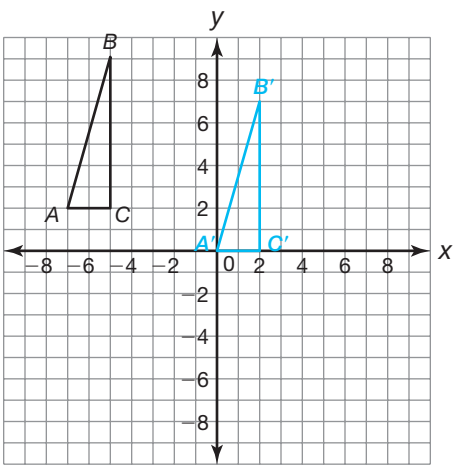
Name _____ Date _____

Looking at Something Familiar in a New Way
Area and Perimeter of Triangles on the Coordinate Plane

Problem Set

Determine the perimeter of each given triangle on the coordinate plane. Round your answer to the nearest hundredth, if necessary.

1. Triangle *ABC*



$A'C' = 2, B'C' = 7$

$A'B' = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(2 - 0)^2 + (7 - 0)^2}$

$= \sqrt{(2)^2 + (7)^2}$

$= \sqrt{4 + 49}$

$= \sqrt{53}$

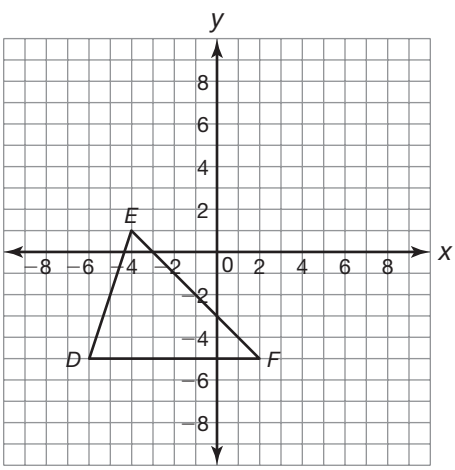
Perimeter $= A'B' + B'C' + A'C'$

$= \sqrt{53} + 7 + 2$

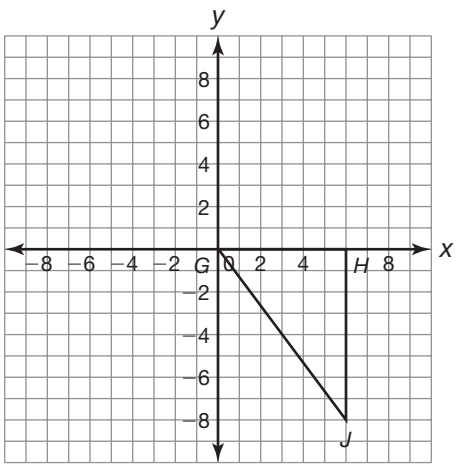
≈ 16.28

The perimeter is approximately 16.28 units.

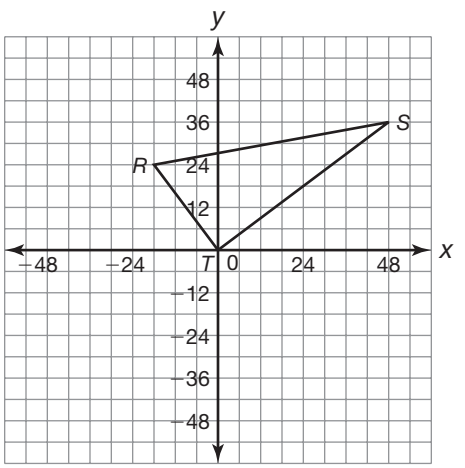
2. Triangle *DEF*



3. Triangle *GHJ*

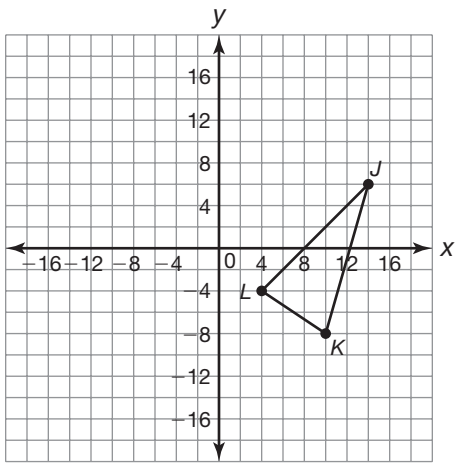


4. Triangle *RST*

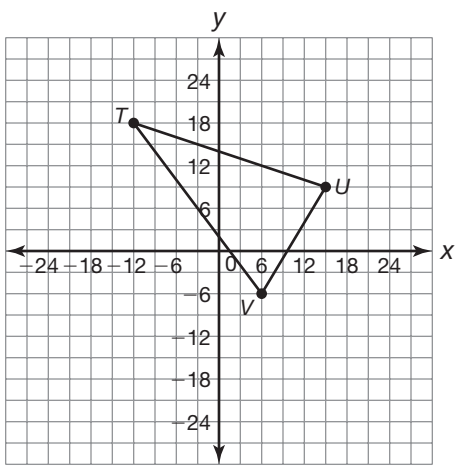


Name _____ Date _____

5. Triangle *JKL*

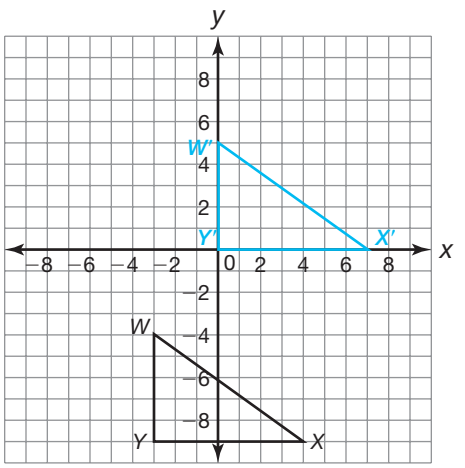


6. Triangle *TUV*



Determine the area of each given triangle on the coordinate plane. Round your answer to the nearest hundredth, if necessary.

7. Triangle *WXY*



$W'Y' = 5, X'Y' = 7$

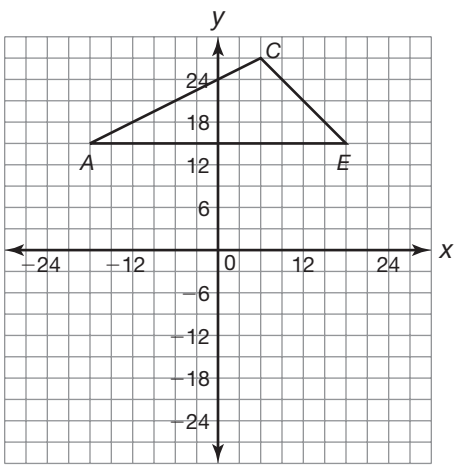
$Area = \frac{1}{2}bh$

$= \frac{1}{2}(7)(5)$

$= 17.5$

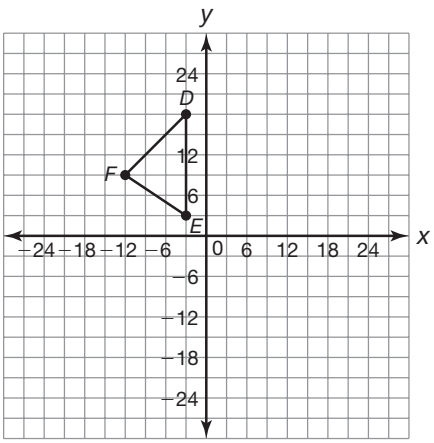
The area is 17.5 square units.

8. Triangle *ACE*

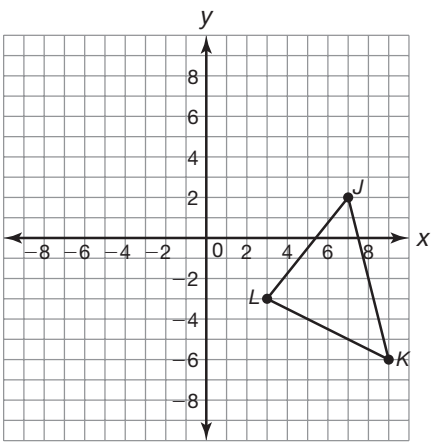


Name _____ Date _____

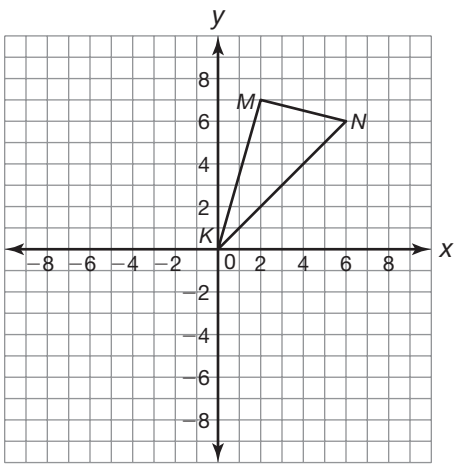
9. Triangle *DEF*



10. Triangle *JKL*

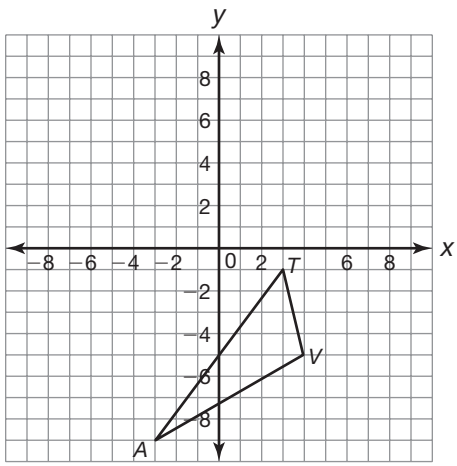


11. Triangle *KMN*



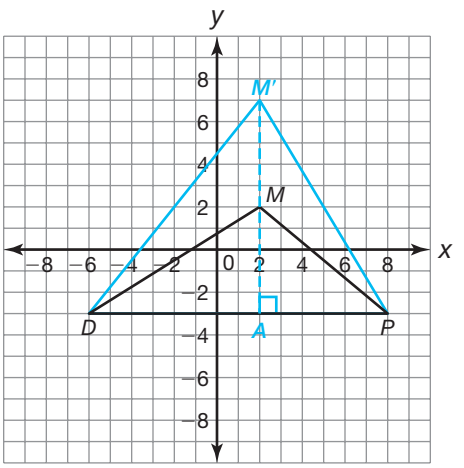
Name _____ Date _____

12. Triangle *ATV*



Double the area of each triangle as directed. Label the image then calculate the area of the pre-image and the area of the image to verify your solution.

13. Double the area of triangle *DMP* by manipulating the height. Label the image *DM′P*.



AM = 5, *DP* = 14

Area of triangle *DMP*:

$Area = \frac{1}{2}bh$

$= \frac{1}{2}(14)(5)$

$= 35$

The area of triangle *DMP* is 35 square units.

AM′ = 10

Area of triangle *DM′P*:

$Area = \frac{1}{2}bh$

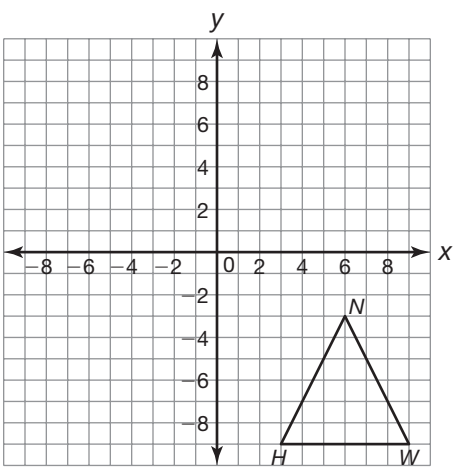
$= \frac{1}{2}(14)(10)$

$= 70$

The area of triangle *DM′P* is 70 square units.

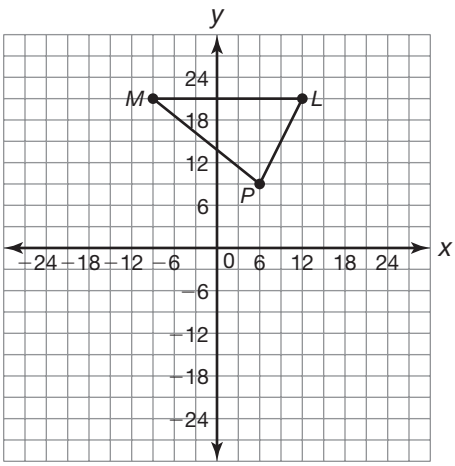
The area of triangle *DM′P* is double the area of triangle *DMP*.

14. Double the area of triangle *HNW* by manipulating the height. Label the image *HN′W*.

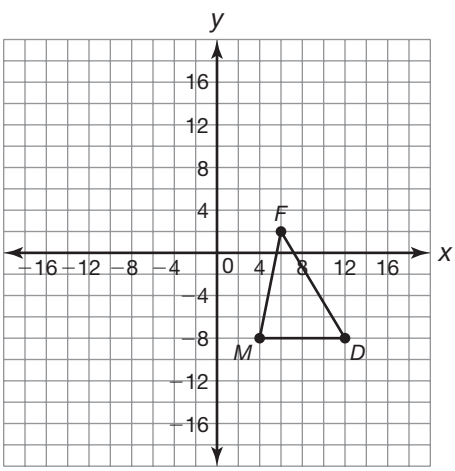


Name _____ Date _____

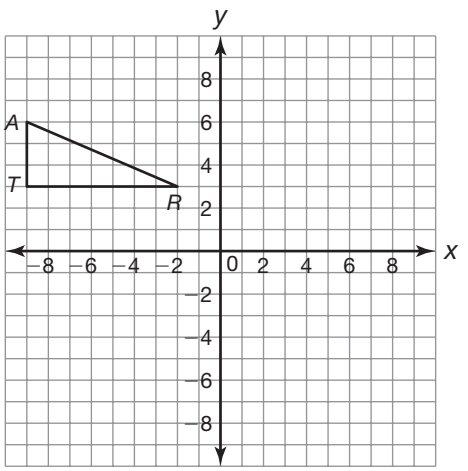
15. Double the area of triangle *MLP* manipulating the height. Label the image *MLP′*.



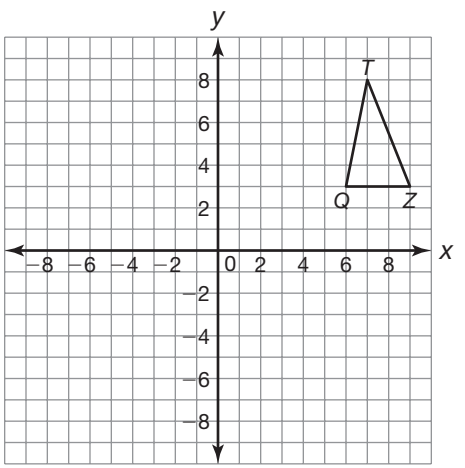
16. Double the area of triangle *MFD* by manipulating the base. Label the image *M′FD*.



17. Double the area of triangle *ART* by manipulating the base. Label the image *AR′T*.



18. Double the area of triangle *QTZ* by manipulating the base. Label the image *Q′TZ*.



Name _____ Date _____

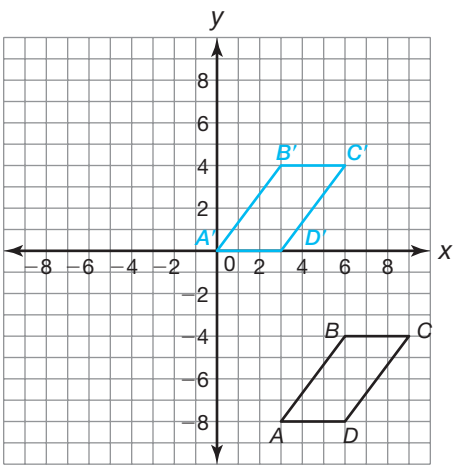
One Figure, Many Names

Area and Perimeter of Parallelograms on the Coordinate Plane

Problem Set

Determine the perimeter of each given parallelogram on the coordinate plane. Round your answer to the nearest hundredth, if necessary.

1. Parallelogram *ABCD*



$A'D' = B'C' = 3$

$A'B' = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(3 - 0)^2 + (4 - 0)^2}$

$= \sqrt{(3)^2 + (4)^2}$

$= \sqrt{9 + 16}$

$= \sqrt{25}$

$= 5$

$C'D' = A'B' = 5$

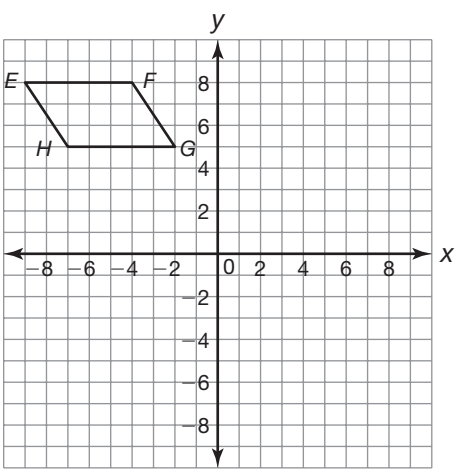
Perimeter $= A'B' + B'C' + C'D' + A'D'$

$= 5 + 3 + 5 + 3$

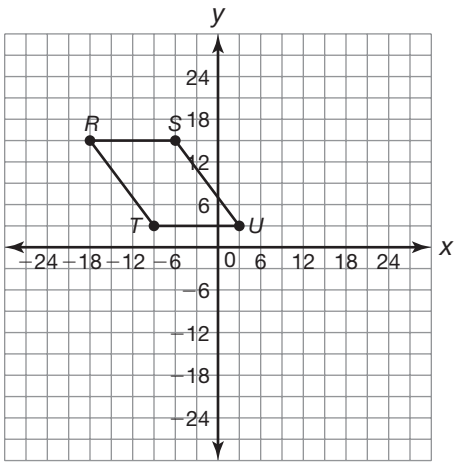
$= 16$

The perimeter is 16 units.

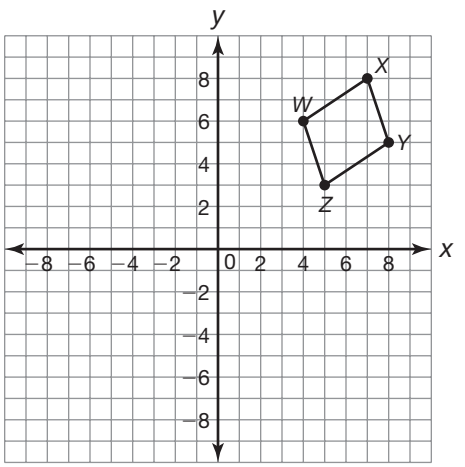
2. Parallelogram *EFGH*



3. Parallelogram *RSTU*

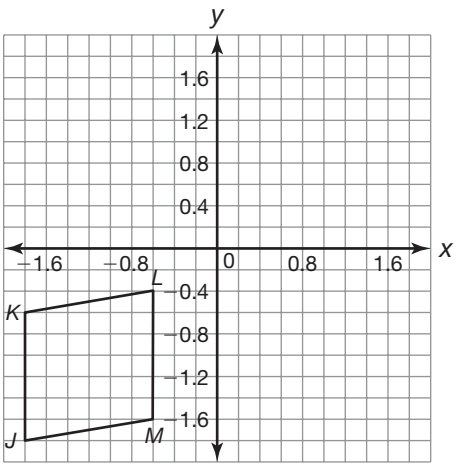


4. Parallelogram *WXYZ*

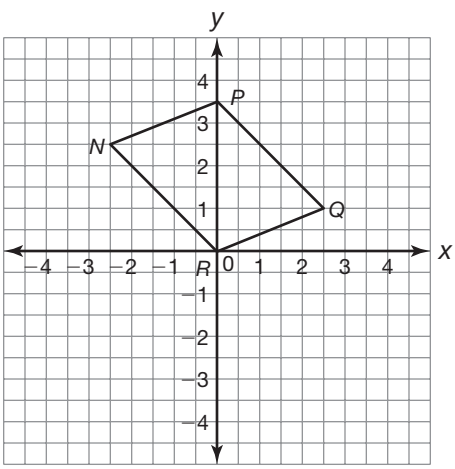


Name _____ Date _____

5. Parallelogram *JKLM*

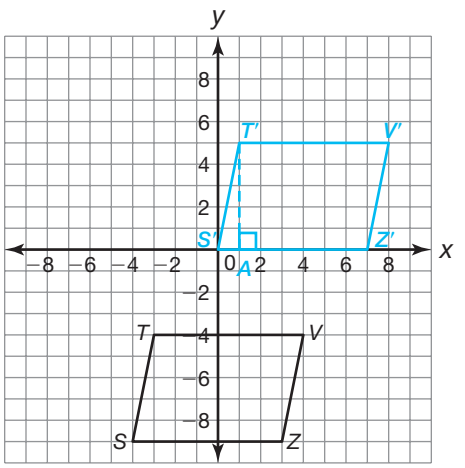


6. Parallelogram *NPQR*



Determine the area of each given parallelogram on the coordinate plane. Round your answer to the nearest hundredth, if necessary.

7. Parallelogram *STVZ*



AT′ = 5, *S′Z′* = 7

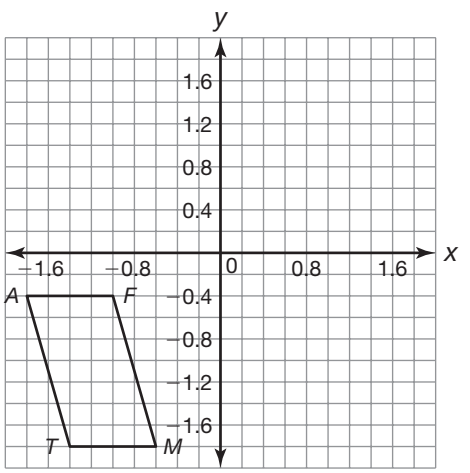
Area = *bh*

= (7)(5)

= 35

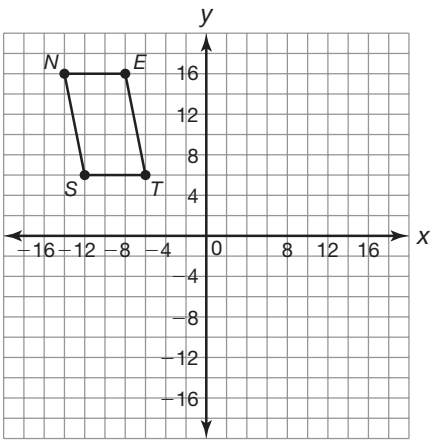
The area is 35 square units.

8. Parallelogram *AFMT*.

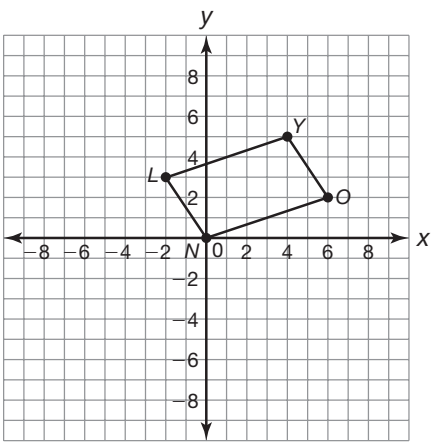


Name _____ Date _____

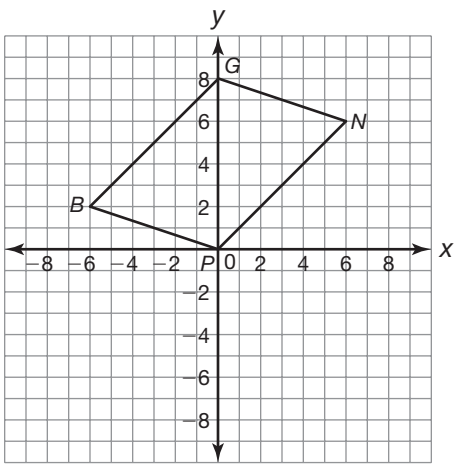
9. Parallelogram *NEST*



10. Parallelogram *LYON*

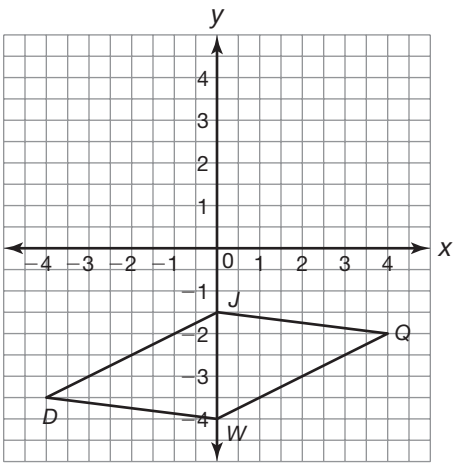


11. Parallelogram *BGNP*



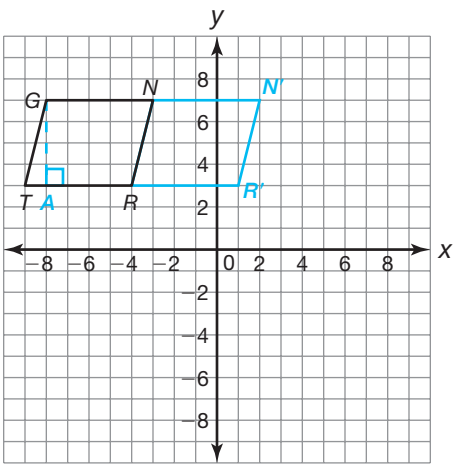
Name _____ Date _____

12. Parallelogram *DJQW*



Double the area of each parallelogram as directed. Label the image, and then calculate the area of the pre-image and the image to verify your solution.

13. Double the area of parallelogram *GNRT* by manipulating the base. Label the image *GN′R′T*.



AG = 4, *RT* = 5

Area of parallelogram *GNRT*:

Area = *bh*

= (5)(4)

= 20

The area is 20 square units.

R′T = 10

Area of parallelogram *GN′R′T*:

Area = *bh*

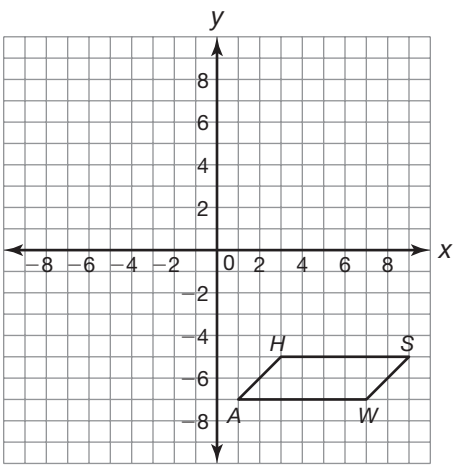
= (10)(4)

= 40

The area is 40 square units.

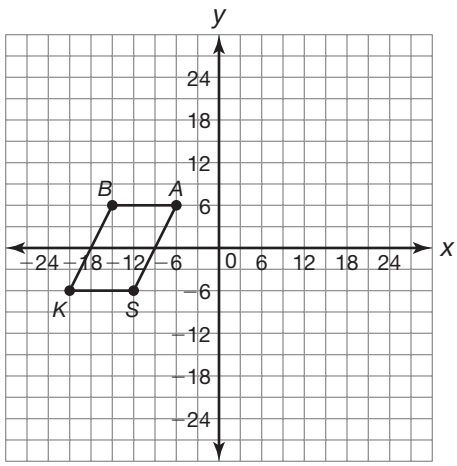
The area of parallelogram *GN′R′T* is double the area of parallelogram *GNRT*.

14. Double the area of parallelogram *AHSW* by manipulating the base. Label the image *A′H′SW*.

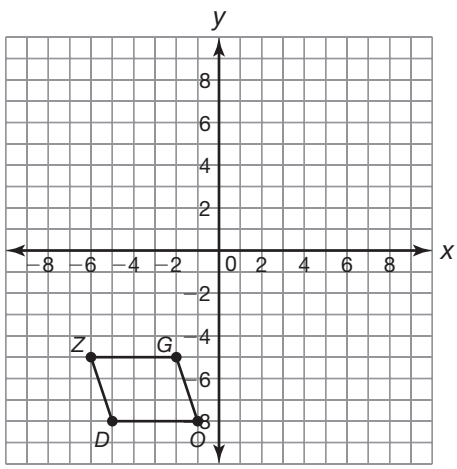


Name _____ Date _____

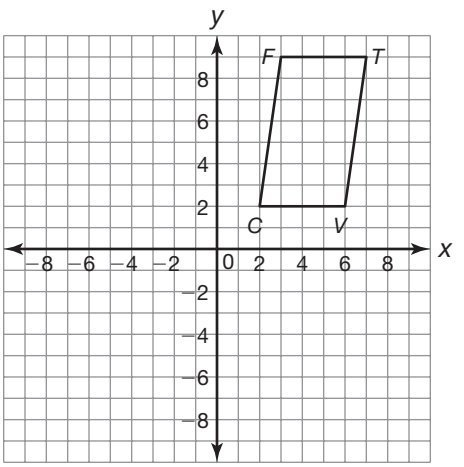
15. Double the area of parallelogram *BASK* by manipulating the base. Label the image *BA′S′K*.



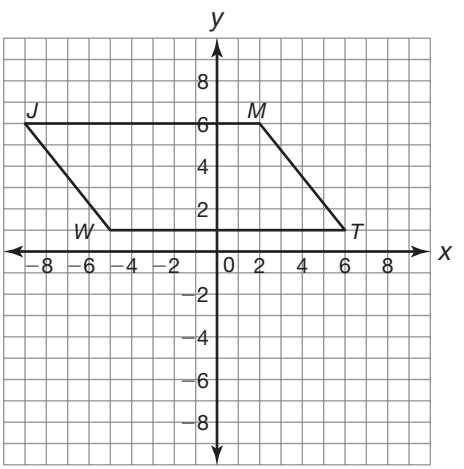
16. Double the area of parallelogram *DOGZ* by manipulating the height. Label the image *DOG′Z′*.



17. Double the area of parallelogram *CFTV* by manipulating the height. Label the image *C′FTV′*.



18. Double the area of parallelogram *JMTW* by manipulating the height. Label the image *JMT′W′*.



Name _____ Date _____

Let's Go Halfsies!

Determining the Perimeter and Area of Trapezoids and Composite Figures

Vocabulary

Define each term in your own words.

1. bases of a trapezoid

2. legs of a trapezoid

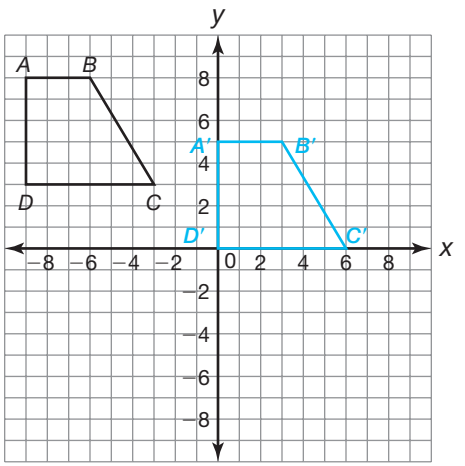
3. regular polygon

4. composite figures

Problem Set

Determine the perimeter of each given figure on the coordinate plane. Round your answer to the nearest hundredth, if necessary.

1. Trapezoid *ABCD*



$A'B' = 3, A'D' = 5, C'D' = 6$

$B'C' = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(6 - 3)^2 + (0 - 5)^2}$

$= \sqrt{(3)^2 + (-5)^2}$

$= \sqrt{9 + 25}$

$= \sqrt{34}$

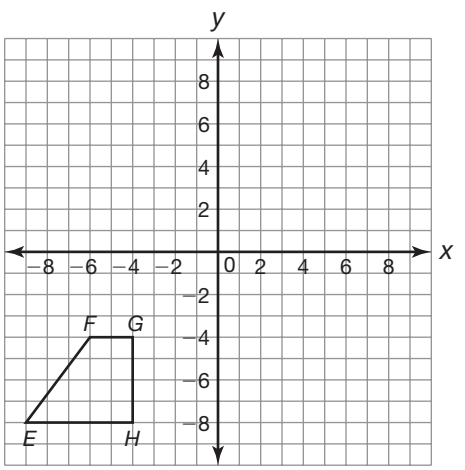
Perimeter $= A'B' + B'C' + C'D' + A'D'$

$= 3 + \sqrt{34} + 6 + 5$

≈ 19.83

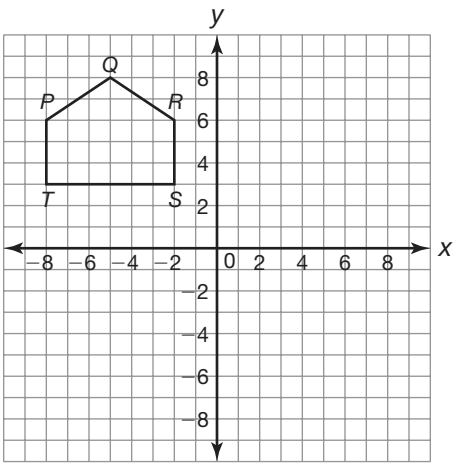
The perimeter is approximately 19.83 units.

2. Trapezoid *EFGH*

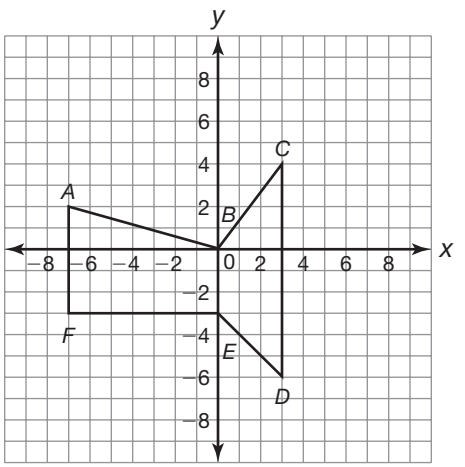


Name _____ Date _____

3. Figure *PQRST*

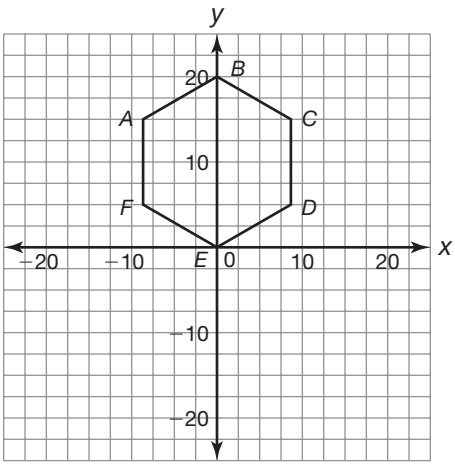


4. Figure *ABCDEF*

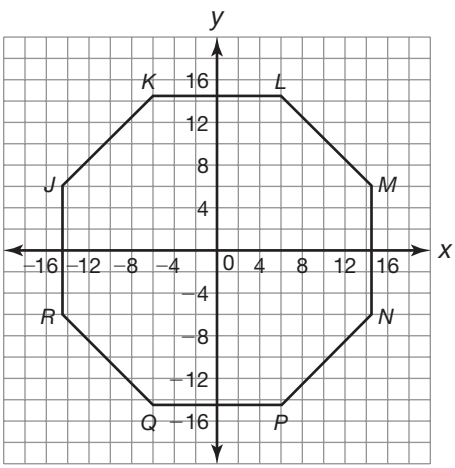


Name _____ Date _____

5. Regular hexagon *ABCDEF* with coordinates $A(-5\sqrt{3}, 15)$, $B(0, 20)$, $C(5\sqrt{3}, 15)$, $D(5\sqrt{3}, 5)$, $E(0, 0)$, and $F(-5\sqrt{3}, 5)$

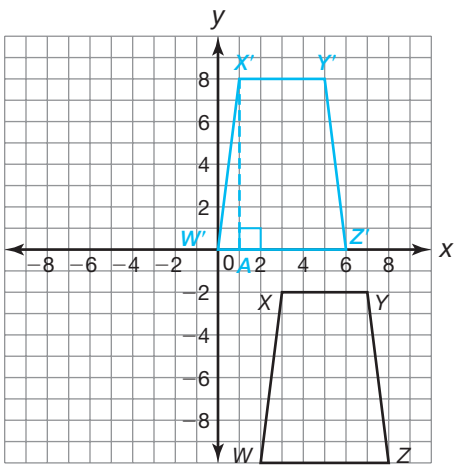


6. Regular octagon *JKLMNPQR* with coordinates $J(-6 - 6\sqrt{2}, 6)$, $K(-6, 6 + 6\sqrt{2})$, $L(6, 6 + 6\sqrt{2})$, $M(6 + 6\sqrt{2}, 6)$, $N(6 + 6\sqrt{2}, -6)$, $P(6, -6 - 6\sqrt{2})$, $Q(-6, -6 - 6\sqrt{2})$, and $R(-6 - 6\sqrt{2}, -6)$



Determine the area of each given figure in the coordinate plane. Round your answer to the nearest hundredth, if necessary.

7. Trapezoid *WXYZ*



$AX' = 8,\ W'Z' = 6,\ X'Y' = 4$

$Area = \frac{1}{2}(b_1 + b_2)h$

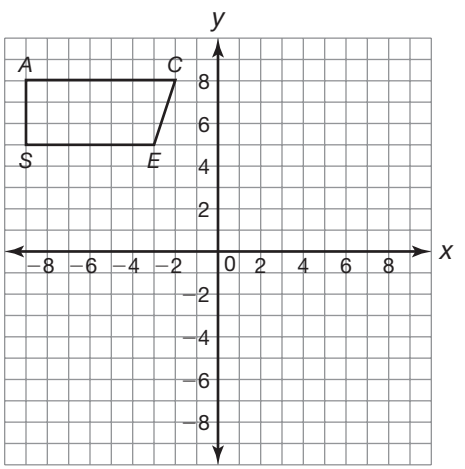
$= \frac{1}{2}(6 + 4)(8)$

$= \frac{1}{2}(10)(8)$

$= 40$

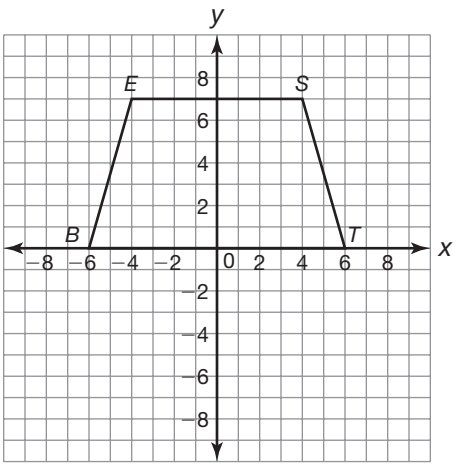
The area is 40 square units.

8. Trapezoid *ACES*

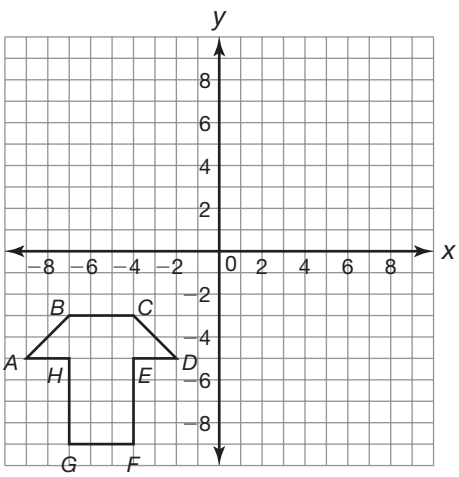


Name _____ Date _____

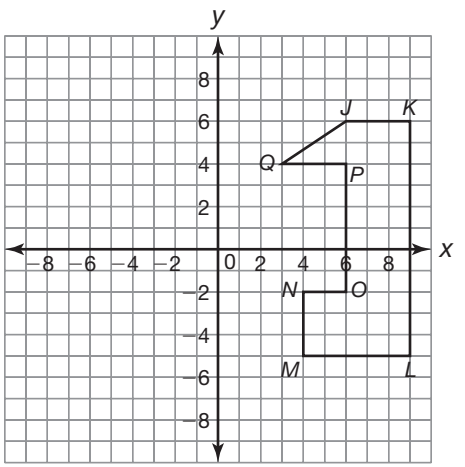
9. Trapezoid *BEST*



10. Figure *ABCDEFGH*



11. Figure *JKLMNOPQ*



Name _____ Date _____

12. Figure *MNPQRST*