3.3 Use ratios of length, perimeter, and area
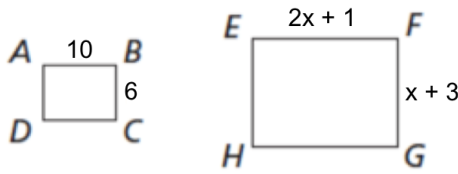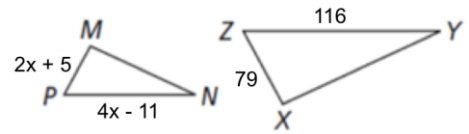
Directions: Solve for x. Then find the length of the indicated side.

1)
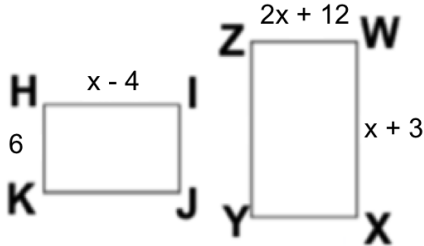$ABCD \sim EFGH$

A 10 B

6

D   C

E 2x + 1 F

x + 3

H   G

$EF =$ _____

2) $MNP \sim \Delta XYZ$

2x + 5

M

P

4x - 11 N

Z 116 Y

79

X

$MP =$ _____

3) $HIJK \sim WXYZ$

H x - 4 I

6

K   J

Z 2x + 12 W

x + 3

Y   X

$WX =$ _____

4) $HIJK \sim PSRQ$

H 2x - 4 I

x - 2

K   J

P

Q R

x + 7

S

50
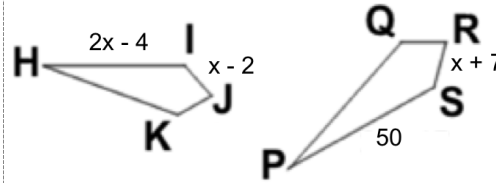
$HI =$ _____

5) Jenny is 5.2 feet tall. To find the height of a light pole, she measured her shadow, which was 8.7 feet long, and the pole's shadow, which was 21 feet long. What is the height of the light pole to the nearest tenth of a foot?

6) Mr. Lloyd wants to build a dollhouse for his daughter that is proportional to their house. He measured the living room of his house and it is 12 ft by 16 ft. What will be the dimensions of the dollhouse living room if every foot of the actual house is equal to $\frac{1}{2}$ inch in the dollhouse?

Directions: For each pair of similar figures, find the missing information.

7)
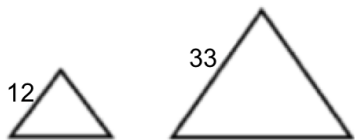
p = 34 in   p = ?

A = ?   A = 1028.5 in²

8)

40   12

p = ?   p = 42 in

A = 1200 in²   A = ?

9)

21

p = 105 in   p = 30 in

A = 392 in²   A = ?

10)

24   x

A = 320 in²   A = 45 in²

p = 96 in   p = ?

Directions: Find the indicated area, perimeter or corresponding side length using the given ratio.

11) Farmer John wants to double the perimeter of his garden, which is currently 10 ft by 20 ft. If 1 bag of soil covers about 70 ft², how many bags will he need to buy?

12) The perimeter of the first trapezoid is 65 in and the perimeter of the second trapezoid is 91 in. If the area of the second trapezoid is 637 in², what is the area of the first trapezoid?

13) The ratio of the corresponding sides of two similar rectangles is a:b. The area of the first rectangle is 726 square units. The area of the second rectangle is 1014 square units. Find the values of a and b, and then find the product of a and b.

14) The ratio of the corresponding sides of two similar triangles is a:b. The perimeter of the first triangle is 135 units. The perimeter of the second triangle is 175 units. Find the values of a and b, and then find the sum of a and b.

a = _____   b = _____   product = _____

a = _____   b = _____   sum = _____

3.4 Perform compositions of transformations, including dilations

15) Determine the coordinates of point P' after the indicated composition of transformations.

a) P(8,4) is translated 4 units vertically and dilated by a factor of $\frac{1}{4}$ centered at the origin.

P': _____

P'': _____

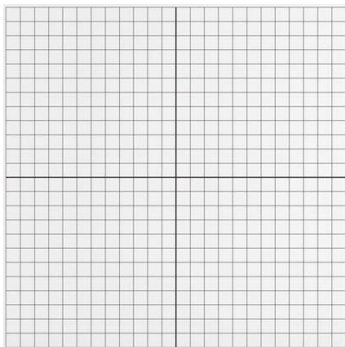b) P(4,8) is dilated by a factor of 3.5 centered at the origin and reflected across the *y*-axis.

P': _____

P'': _____

Directions: The vertices of ΔPQR are P(1, 3), Q(-2, 4), and R(4, 6). Give the coordinates of $\Delta P'Q'R'$ and $\Delta P''Q''R''$ Graph the image of ΔPQR after a composition of transformations in the order they are listed.

16) Transformation #1: Dilate by a factor of 3 centered at the point (1, 8)
Transformation #2: Rotate 90° CW about the origin.
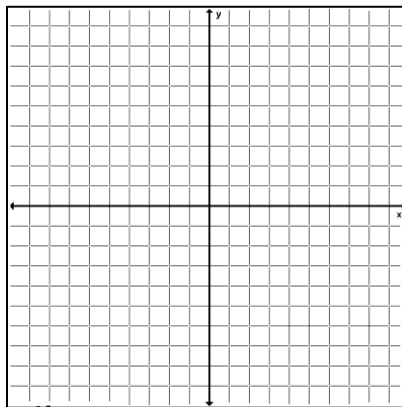
P'   P''

Q'   Q''

R'   R''

17) Transformation #1: Rotate 180° about the origin
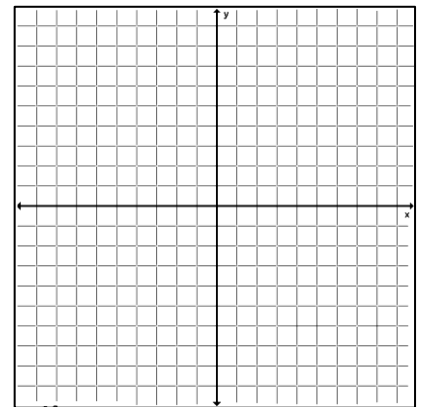Transformation #2: Dilate by a factor of 2 centered at the origin.
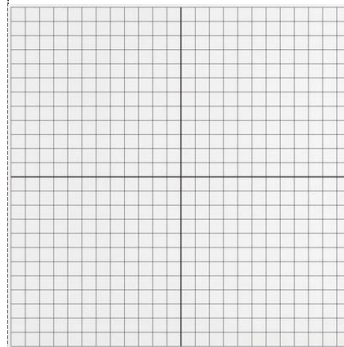
P'   P''

Q'   Q''

R'   R''

18) POINT A(2, -5)
Dilate by factor of 1.5 centered at the origin.
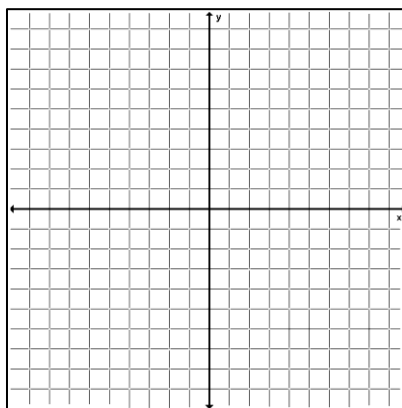Reflect over line y = x.
Find the sum of image coordinates.

SUM = _____

19) POINT A(-1, -2)
Dilate by factor of 4 centered at the origin.
Then translate by $(x, y) \rightarrow (x + 7, y + 12)$
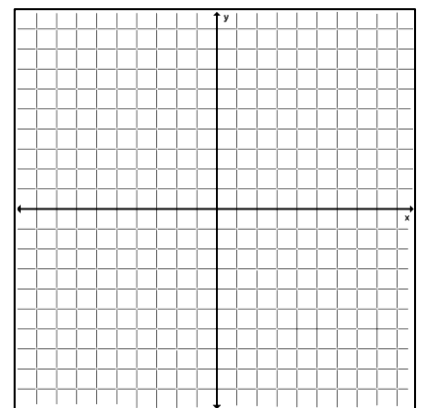Find the sum of image coordinates.

SUM = _____

20) POINT A(6, 4)
Rotate 180° CW about the point (-2,1).
Dilate by factor of $\frac{1}{2}$ centered at the origin.
Find the sum of image coordinates.

SUM = _____

21) POINT A(9, -2)
Reflect over the x-axis.
Dilate by a factor of $\frac{1}{3}$ centered at the point (-3, -4). Find the sum of image coordinates.

SUM = _____