13.1 Similar Figures

MATH 7

Similar -

CORRESPONDING ANGLES

∠L corresponds to _____

∠O corresponds to _____

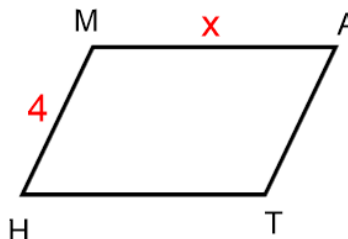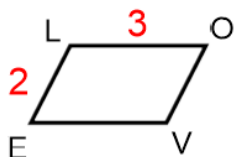∠V corresponds to _____

∠E corresponds to _____

CORRESPONDING SIDES
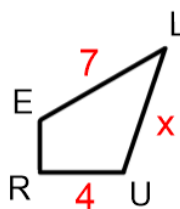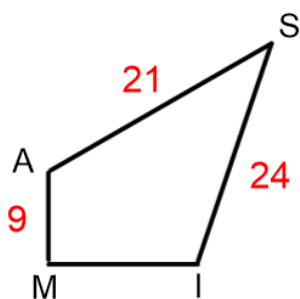
$\overline{MA}$ corresponds to _____

$\overline{AT}$ corresponds to _____

$\overline{TH}$ corresponds to _____

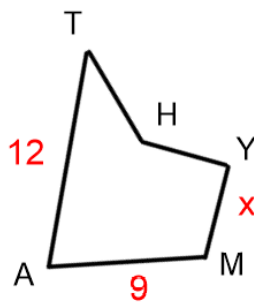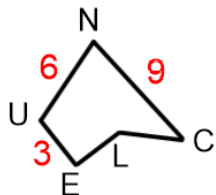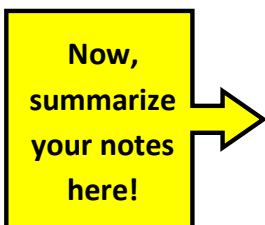$\overline{HM}$ corresponds to _____

Scale Factor = _____ or _____

Scale Factor =

Scale Factor =

SUMMARY:

Now, summarize your notes here!

13.1 Similar Figures

PRACTICE

The following figures are similar. Fill in the blanks.

1.

$ABCD \sim$ _____
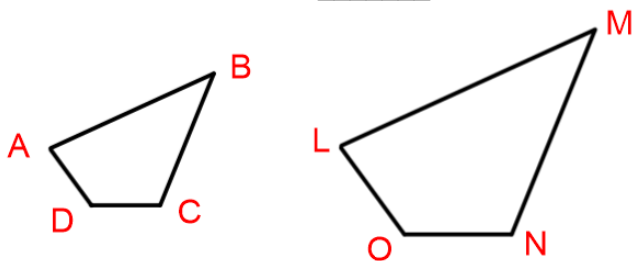
a. $\angle L$ corresponds to _____

b. $\overline{DC}$ corresponds to _____

c. $\angle C$ corresponds to _____

d. $\overline{NM}$ corresponds to _____

2.

$ANT \sim$ _____

a. $\angle N$ corresponds to _____

b. $\overline{NA}$ corresponds to _____

c. $\angle Y$ corresponds to _____

d. $\overline{FY}$ corresponds to _____

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The following figures are similar. State the scale factor, set up a proportion, and find the missing side.
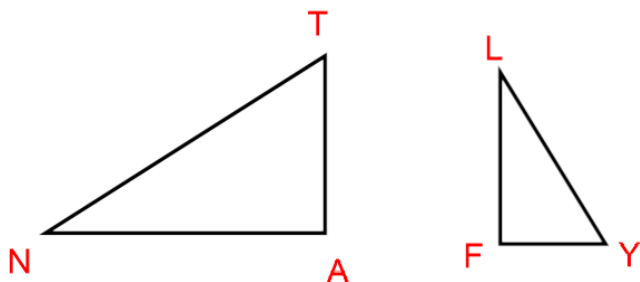
3.
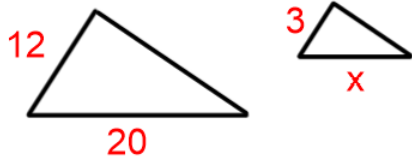
12 3 x

20

Scale Factor =

4.

x 4 8 16

Scale Factor =

5.

9 4 2 x

Scale Factor =

6.

x 6 8 48

Scale Factor =

7.

x 15 20 9 3 12

Scale Factor =

8.

x 6 4 10 16

Scale Factor =

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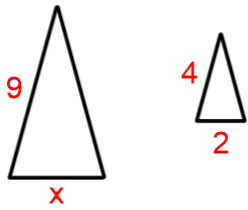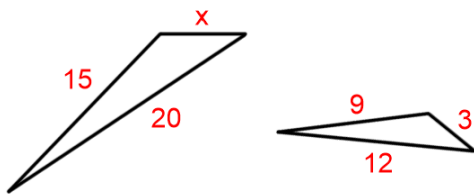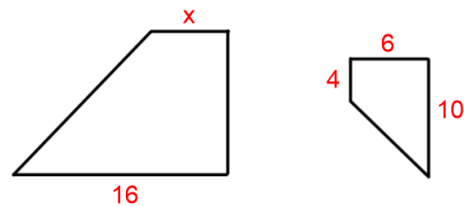
Use the similar figures shown below to answer 1-4.

1. $\angle T$ corresponds to _____
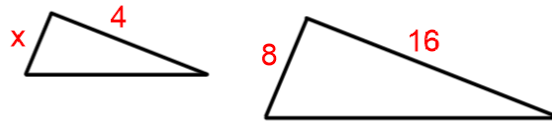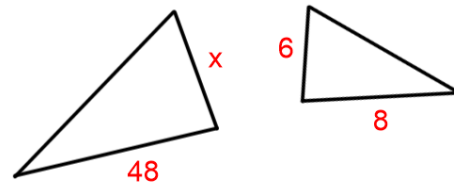
2. $\overline{DG}$ corresponds to _____

3. What is the scale factor?

4. Find the length of CT.

$$CAT \sim DOG$$
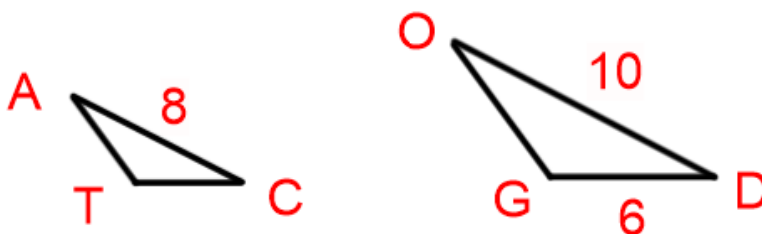
5. A 32 foot tree casts a 60 foot shadow as shown below. A man next to the tree casts a 12 foot shadow. How tall is the man? Justify your solution.

EXIT TICKET –

The scale factor of the similar figures below is 5:2. Given $TE = 10$ feet, find the length of AD.

$$KITE \sim QUAD$$
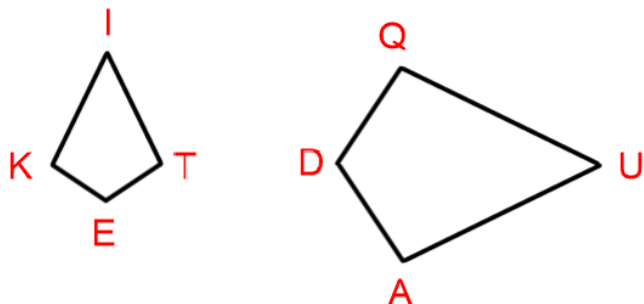
13.2 Scale Drawings

Original Triangle

6   10

9
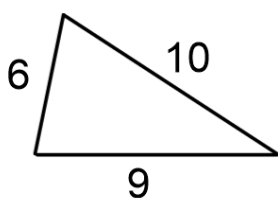
Scale Factor = 2

Scale Factor = $\frac{1}{3}$
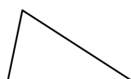
Scale Factor = $\frac{7}{4}$
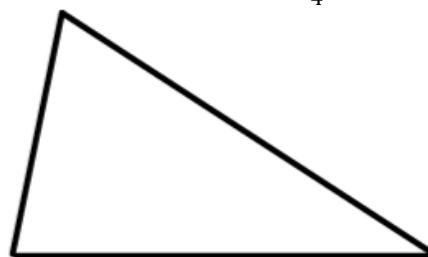
MODELS

Below is a replica of 1/18 scale 1958 Chevrolet Corvette diecast model. Diecast model car 1:18. If the real convertible is 63 inches wide, how wide is the model?

MAPS

If it is 2.5 cm on the map from Beijing to Shanghai, how far is that in real life?

1.5 cm = 400 km

DRAWINGS

1 unit = 5 feet
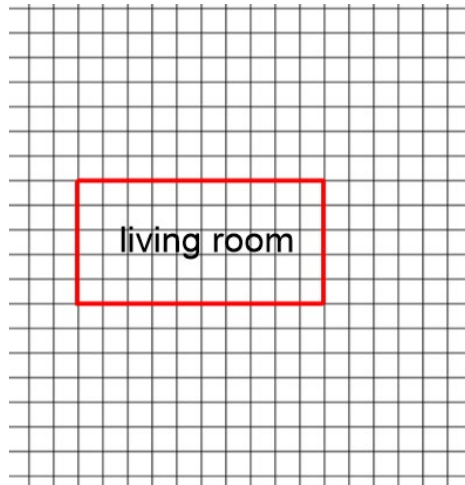
What are the dimensions of the real living room?

Add a room off the living room that is 15' by 18.5'.

SUMMARY:
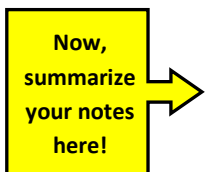
Now, summarize your notes here!

13.2 Scale Drawings

Label the sides of the similar figures with the given scale factor.

1.

Original Triangle

5

3

6
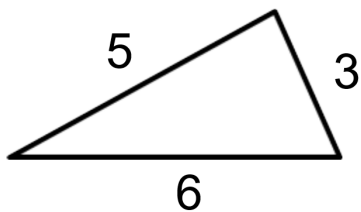
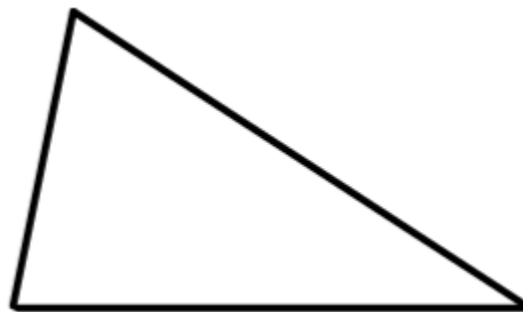Scale Factor $= \frac{3}{4}$

Scale Factor $= \frac{3}{2}$

2.

Original Triangle

8

16

12
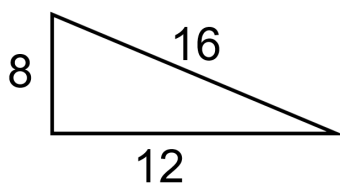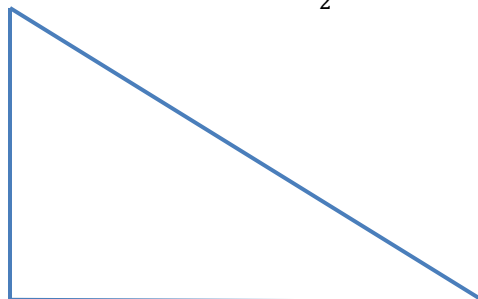
Scale Factor $= \frac{5}{2}$

Scale Factor $= \frac{1}{4}$

Use proportions to solve the following.

3. Hot Wheels are designed to be 1:64 of the real automobile. Mr. Brust wants to make a Hot Wheel made of his Toyota Sienna Minivan. If the width of Mr. Brust's minivan is 200 cm. How wide would his minivan Hot Wheel be?

4. An architect makes a model of house with a pool. 1.5 cm of the model is equal to 3 meters in real life. If the model pool is 3.2 cm long, how long is the real pool?

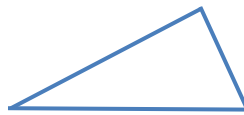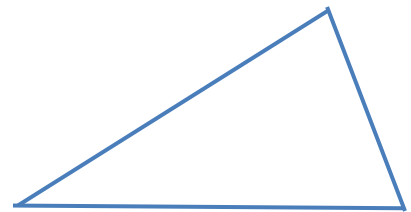5. Mr. Brust wants to drive from Dayton to Cincinnati. The map has a scale of 2 cm = 15 miles. If Mr. Brust measure the distance between the two cities as 7 cm. How far apart are the cities?
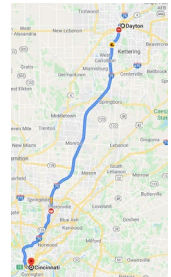
6. The scale of a map is ½ inch equals 28 miles. If two cities are 460 miles away in real life, how far apart will they be drawn on the map?

7. Mr. Brust drew the picture of a flea below. The ratio of drawing to real flea is 80:1. How long is a real flea?

←— 22 mm —→
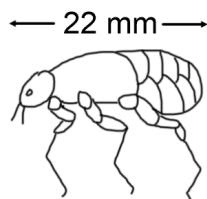
8. The scale is 2 units = 15 feet. What are the real-life dimensions of the family room?

Family Room
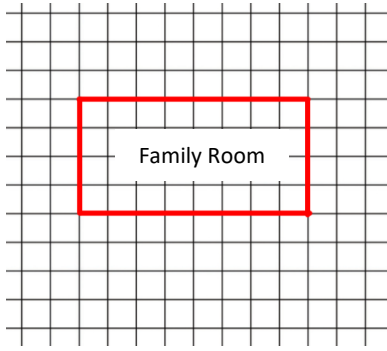
9. The scale is 1 unit = 7 feet. Draw a scaled version of a 42 foot by 24.5 foot rectangular kitchen.
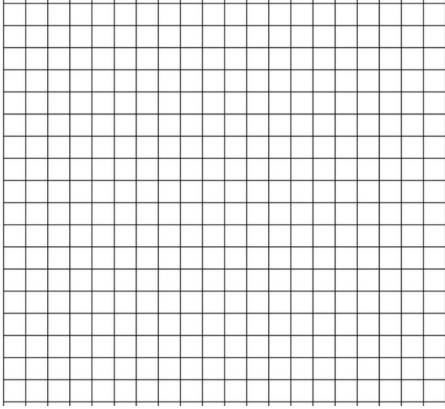
10. Amazon is selling a model of the F/A-18 Hornet series fighter aircraft. The description is shown next to the model.

Model Description:

Skill Level: 2

Scale: 1/48

Length: 15"

Wingspan: 11"

Parts: 110+

a. What is the length of a real Hornet fighter aircraft? SHOW WORK!

b. What is the wingspan of a real Hornet fighter aircraft? SHOW WORK!

Use proportions to solve the following.

1. A GI Joe figure is 2:45 of the real person. If the figure is 8.25 cm, how tall is the real person?

2. The key on a map says that 3 cm = 120 km. How far on the map would 1500 km be?

3. Make a scale drawing of the following. Include your scale factor!
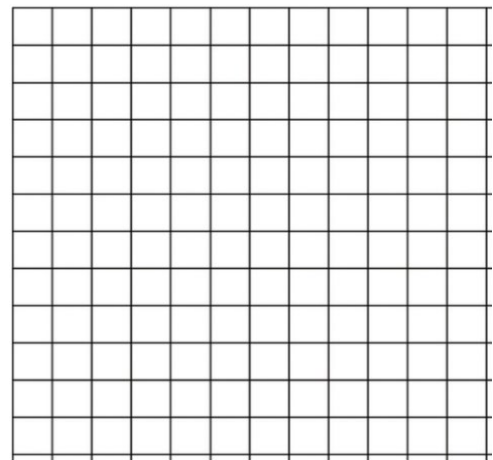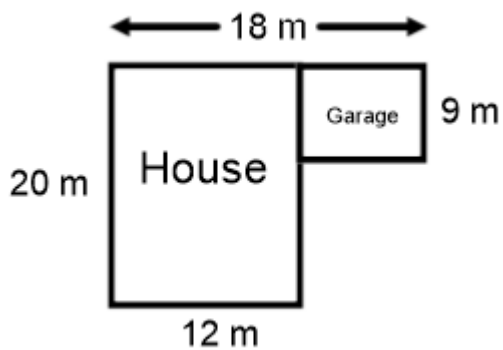
EXIT TICKET –

Mr. Sullivan wants to make a mural on the wall of his face. He plans to enlarge his face by a factor of $8\frac{1}{2}$. Is the wall below big enough for his head? Justify your solution.
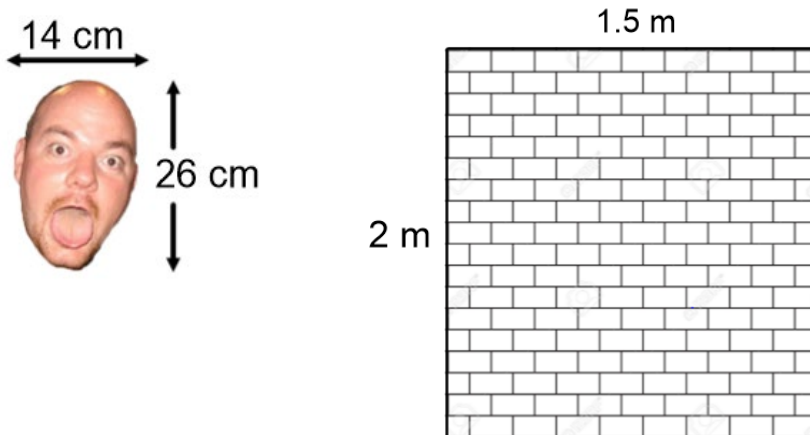
13.3 Area and Perimeter

Original Rectangle

Scale Factor = 2

7 cm

5 cm
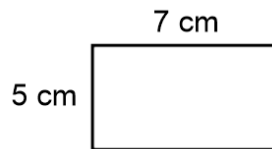
Original Perimeter =

New Perimeter =

Original Area =

New Area =

The ratio of original perimeter to similar perimeter is_____

The ratio of original area to similar area is _____

A rectangle with perimeter of 30 cm is scaled up by a factor of 3. What is the new rectangle's perimeter?

A rectangle with area of 20 cm² is scaled up by a factor of 3. What is the new rectangle's area?

Find the perimeter and area.

Original Triangle

Scale Factor $= \frac{1}{4}$

5 ft

12 ft

Original Area =

New Area =

SUMMARY:

Find the area of the following. Label you answer!
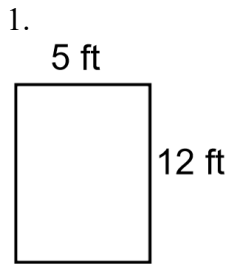
1.

5 ft

12 ft

2.

15 cm

8 cm

24 cm

3.

40 m

30 m

50 m

Draw and label the sides of the similar figures with the given scale factor. Find the perimeter and area.

4.

Original Figure   Scale Factor = 3

5 cm

8 cm

Original Perimeter =

Original Area =   New Perimeter =

New Area =

How many times bigger is the new area to the original area?

5.

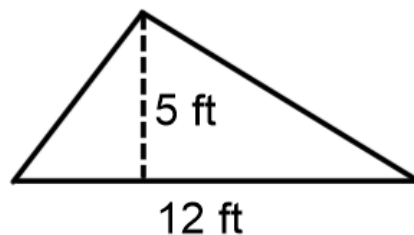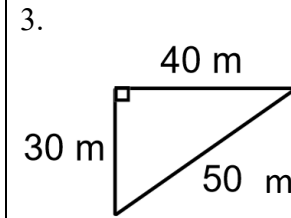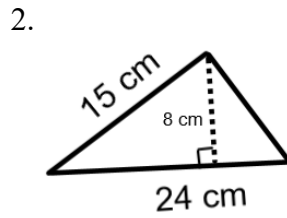Original Figure   Scale Factor = 2

10 m

6 m

8 m

Original Perimeter =   New Perimeter =

Original Area =   New Area =

How many times bigger is the new perimeter to the original perimeter?

Label the sides of the similar figures with the given scale factor. Find the perimeter and area.

6.

Original Figure
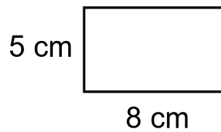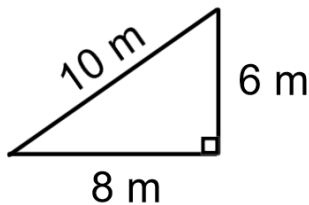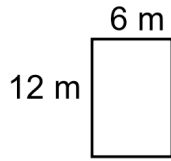
Scale Factor $= \frac{1}{2}$

6 m

12 m

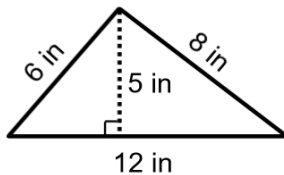Original Perimeter =

New Perimeter =

Original Area =

New Area =

How many times bigger is the new perimeter to the original perimeter?

7.

Original Figure

Scale Factor = 4

6 in   5 in   8 in

12 in

Original Perimeter =

New Perimeter =

Original Area =

New Area =

How many times bigger is the new area to the original area?

Answer the following.

8. A rectangle with perimeter of 120 cm is scaled up by a factor of 5. What is the new rectangle's perimeter?

9. A rectangle with area of 40 cm^2 is scaled up by a factor of 5. What is the new rectangle's area?

10. A triangle with perimeter of 28 ft is scaled down by a factor of $\frac{3}{4}$. What is the new rectangle's perimeter?
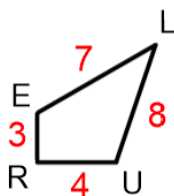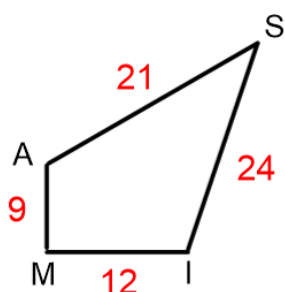
11. A triangle with area of 54 cm^2 is scaled down by a factor of $\frac{1}{3}$. What is the new rectangle's area?

1. Find the area.

5 in

12 in

13 in
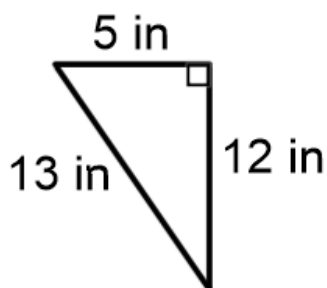
2. A rectangle with area of 24 cm² is scaled up by a factor of 4. What is the new rectangle's area?

3. Given $SIMA \sim LURE$ and the area of figure $SIMA = 36\ m^2$, find the area of figure $LURE$.

S
21
A
24
9
M   12   I

L
7
E
3   8
R   4   U

EXIT TICKET –

Sully is tiling his kitchen below. Tile cost $3.50 per square foot. Mr. Kelly is tiling his kitchen with the same tiles. The dimensions of Kelly's kitchen are twice as big as Sully's kitchen. Mr. Kelly thinks that he will spend twice as much as Sully. Is correct? Justify your solution.

18 ft
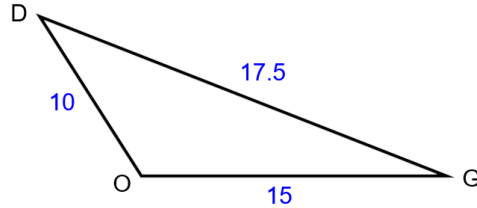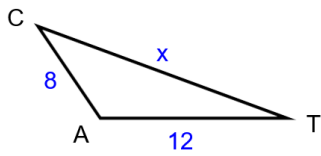
12 ft
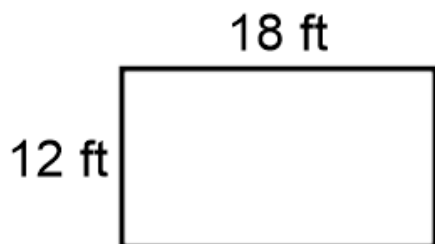
Review

The following figures are similar. Fill in the blanks and answer the questions.
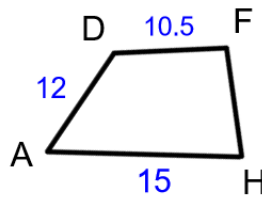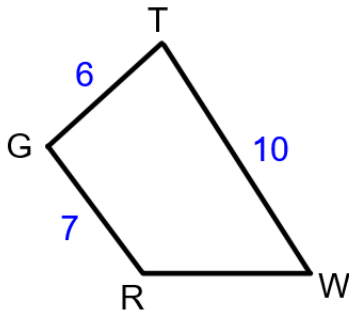
1.

$CAT \sim$ _____

a. Find x.

b. $\overline{AT}$ corresponds to _____

c. $\angle D$ corresponds to _____

d. What is the scale factor?
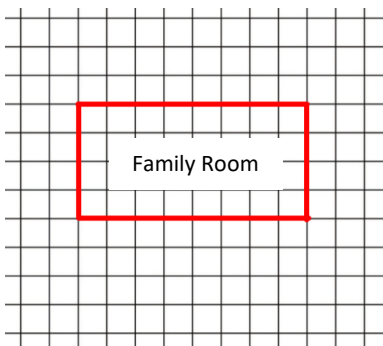
2.

$GRWT \sim$ _____

a. $\overline{GT}$ corresponds to _____

b. $\angle A$ corresponds to _____

c. $\dfrac{WT}{AH} = \dfrac{GT}{FH}$ is true or false?

d. What is the scale factor?

e. Find the length of WR.

f. Find the length of FH.

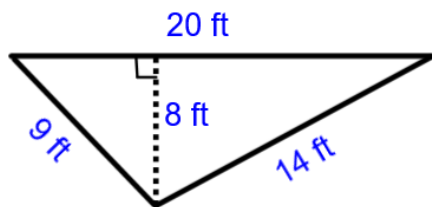3. The scale is 2 units = 13 feet.

a. What are the real-life dimensions of the family room?

b. What is the area of the real family room?

Draw and label the sides of the similar figures with the given scale factor. Find the perimeter and area.

4.

Original Figure   Scale Factor = 2

Original Perimeter =

New Perimeter =

Original Area =

New Area =

How many times bigger is the new perimeter to the original perimeter?

How many times bigger is the new area to the original area?

Use proportions to solve the following.

5. The scale on a map is 1.5 cm equals 40 km in real life. You measure the distance between two cities on the map as 14 cm. How far apart are the cities in real life?

6. A baby doll is 1:12 of a real baby. If the real baby is 14 inches long, how big is the doll?

7. Mr. Kelly buys a wallet size portrait of himself. He wants a poster made of his face from the wallet size that would be at the ratio 15:2. What are the dimensions of the poster?

2.5 cm

8 cm