

Name: \_\_\_\_\_

## UNIT 6 LEARNING GUIDE – GEOMETRY

## INSTRUCTIONS:

Using a pencil, complete the following questions as you work through the related lessons. Show ALL of your work as is explained in the lessons. Do your best and always ask questions if there is anything that you don't understand.

### 6.1 EQUIVALENT RATIOS

1. Reduce each ratio to its simplest form. *Reminder: To reduce a ratio to its simplest form, divide each part of the ratio by the Greatest Common Factor.*

Ex. 4:10

GCF: **2****2:5**

iii. 9:3

GCF:

vi. 6:9

GCF:

i. 15:5

GCF:

iv. 8:24

GCF:

vii. 15:25

GCF:

ii. 2:4

GCF:

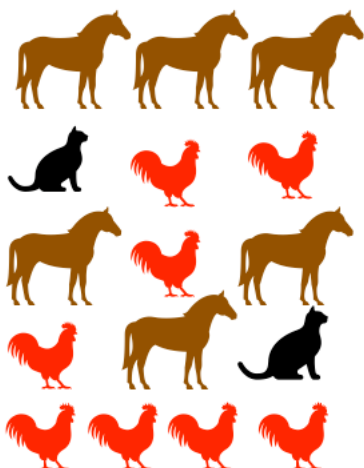
v. 25:100

GCF:

viii. 21:14

GCF:

2. Use the image below to answer the following questions. Write each ratio in its simplest form.



- i. What is the ratio of cats to horses?
- ii. What is the ratio of horses to roosters?
- iii. What is the ratio of roosters to horses?
- iv. What is the ratio of roosters to animals?
- v. What is the ratio of cats to animals?
- vi. What is the ratio of roosters to cats?

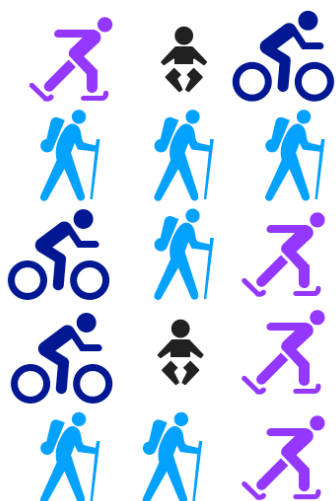
3. Fill in the table.

	Ratio x : y format	Ratio Fraction format	Simplified Fraction
<b>Ex.</b> 7 baseballs to 21 balls	<b>7:21</b>	$\frac{7}{21}$	$\frac{1}{3}$
a. 15 mugs to 35 dishes			
b. 4 dogs to 14 animals			
c. 9 plumbers to 15 employees			
d. 18 swimmers to 42 people			

4. In an aquarium, there are 10 guppies, 8 neon tetras, and 2 goldfish. Write the part to whole ratios as fractions in their simplest form.

- i. Guppies to fish
- ii. Neon tetras to fish
- iii. Goldfish to fish

5. Use the image below to determine the following ratios. Simplify the ratios when possible.  
*Reminder: 3-part ratios cannot be written as fractions.*



**Ex.** Hikers to babies to cyclists  
**6:2:3**

- i. Cyclists to skaters to babies
- ii. Babies to skaters to hikers
- iii. Skaters to cyclists to hikers
- iv. Hikers to babies to skaters

<b>6.2 EQUIVALENT RATIOS</b>
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1. Complete each table of equivalent ratios.

Ex. 

<b>9: 18</b>		
1:2	3:6	18:36

c. 

<b>10: 14</b>		
5:___	30:___	___:28

a. 

<b>6: 9</b>		
2:___	12:___	___:27

d. 

<b>75: 100</b>		
3:___	___:12	___:20

b. 

<b>15: 25</b>		
3:___	___:50	60:___

e. 

<b>20: 30</b>		
2:___	___: 15:	___:150

2. Match each ratio with its simplest form.

- |             |              |
|-------------|--------------|
| a. 60:90    | <b>1:2</b>   |
| b. 56:63    | <b>1:3</b>   |
| c. 25:100   | <b>8:9</b>   |
| d. 500:1000 | <b>11:23</b> |
| e. 22:46    | <b>2:3</b>   |
| f. 36:48    | <b>3:4</b>   |
| g. 27:30    | <b>1:4</b>   |
| h. 13:39    | <b>9:10</b>  |

3. Solve the following problems. *Reminder: Keep track of when you are dealing with part-to-part ratios and part-to-whole ratios. Be sure to show all work.*

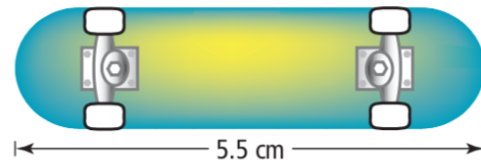
- a. There are 50 teenagers at a swim meet. The ratio of locals to out-of-town participants is 2:3. How many teenagers travelled from out-of-town to the swim meet?



6. Compare ratios in order to answer the following problems. *Reminder: To compare ratios, convert each ratio to a unit ratio.*
- a. A librarian wants to compare the ratios of fiction to non-fiction books checked out of the library. In the first week of school, the ratio is 7:5, whereas in the eighth week of school, the ratio is 22:13. During which week are students checking out a higher ratio of fiction to non-fiction books (ie. more fiction books for every non-fiction book)?
  
  - b. Two brands of fried rice have different ratios of vegetables to rice by weight. *Brand A* has a ratio of 5:8, whereas *Brand B* has a ratio of 2:3. Which brand has the highest ratio of vegetables to rice by weight?
  
  - c. Jane and Karl are trying out for a hockey team. The coach says that it is important that during practices, the ratio of time that players spend on speed drills versus shooting drills is 2:1. If Jane spends 45 minutes on speed drills and 25 minutes on shooting drills and Karl spends 58 minutes on speed drills and 34 minutes on shooting drills, who came closest to meeting the ratio set out by their coach?

## 6.3 SCALE MODELS

1. The scale diagram of a skateboard uses a scale of 1:14. What is the actual length of the skateboard?

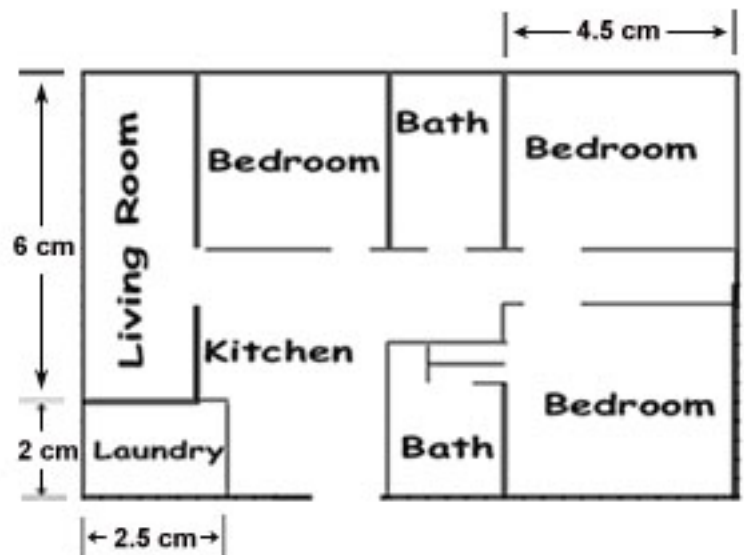


2. The length of the underground pathway is 350 kilometres. If 1 cm represents 35 kilometres on a map, what is the length of the underground pathway on the map?

3. If the house plan uses a scale of 1 cm: 0.6 m, find the following;

a) the length of the living room.

b) the dimensions of the laundry



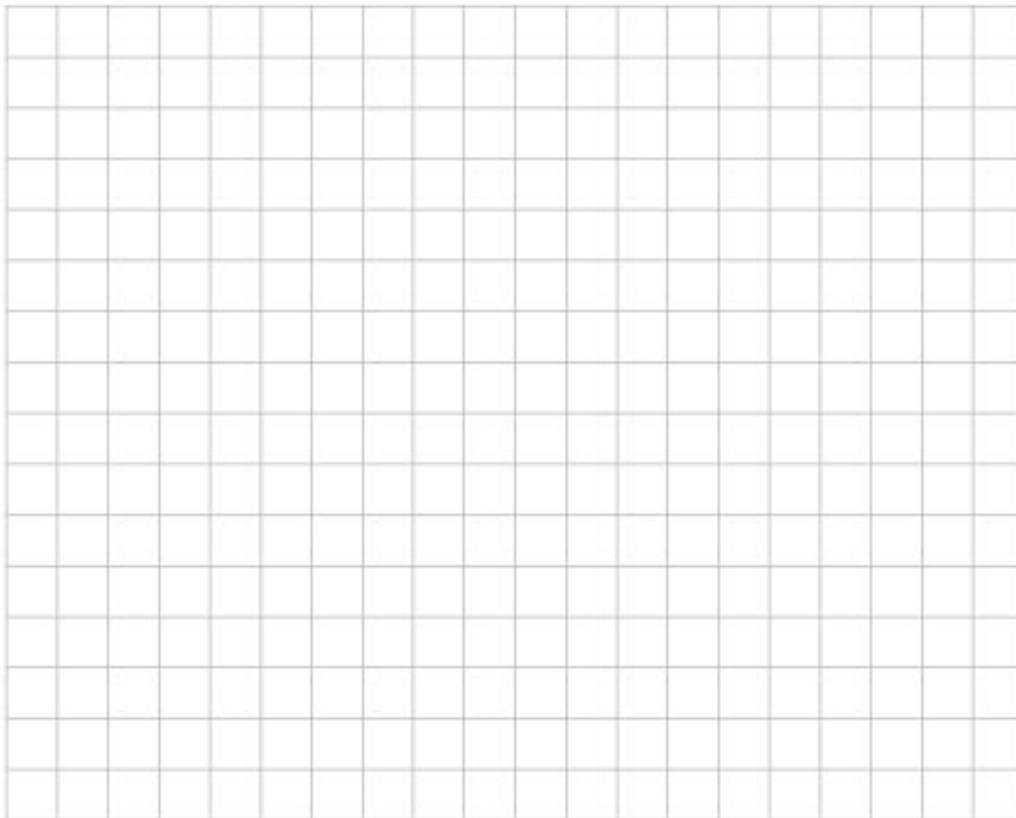
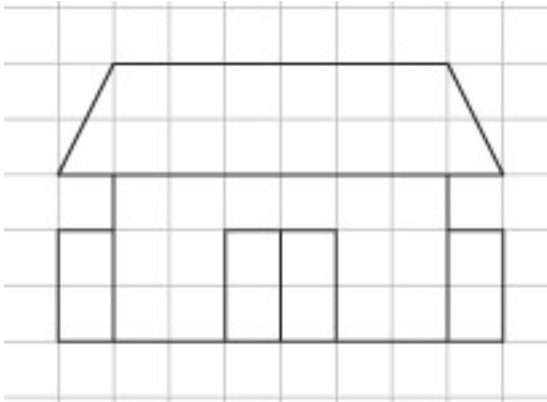
c) the length of the bedroom

4. An actual Canadian quarter has a diameter of 23.88 mm. Calculate the scale factor used to create the diagram of the quarter. Express the answer to the nearest tenth.



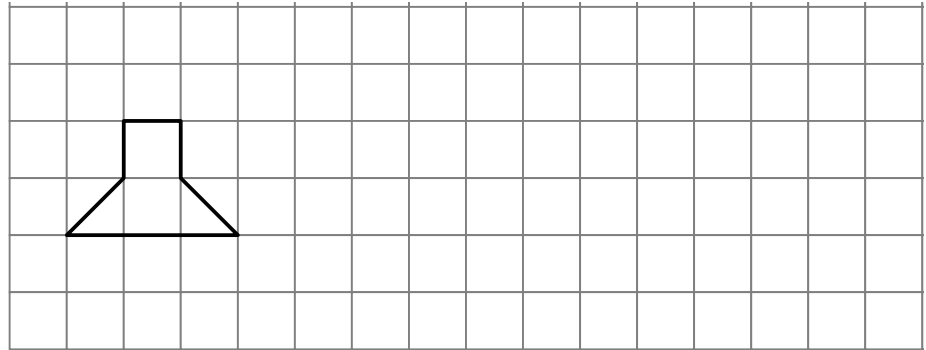
5. An 24 m tall statue was carved and the sculptor used a 8 cm. sketch of the statue as a blueprint. What scale did the sculptor use?
6. Henry wanted to draw a picture of a 100 m tall transmitting tower on a hillock of height 400 m. The combined length of the hillock and the tower on the paper is 10 cm. Find the scale Henry used.

7. Enlarge this shape with a scale factor of 2.

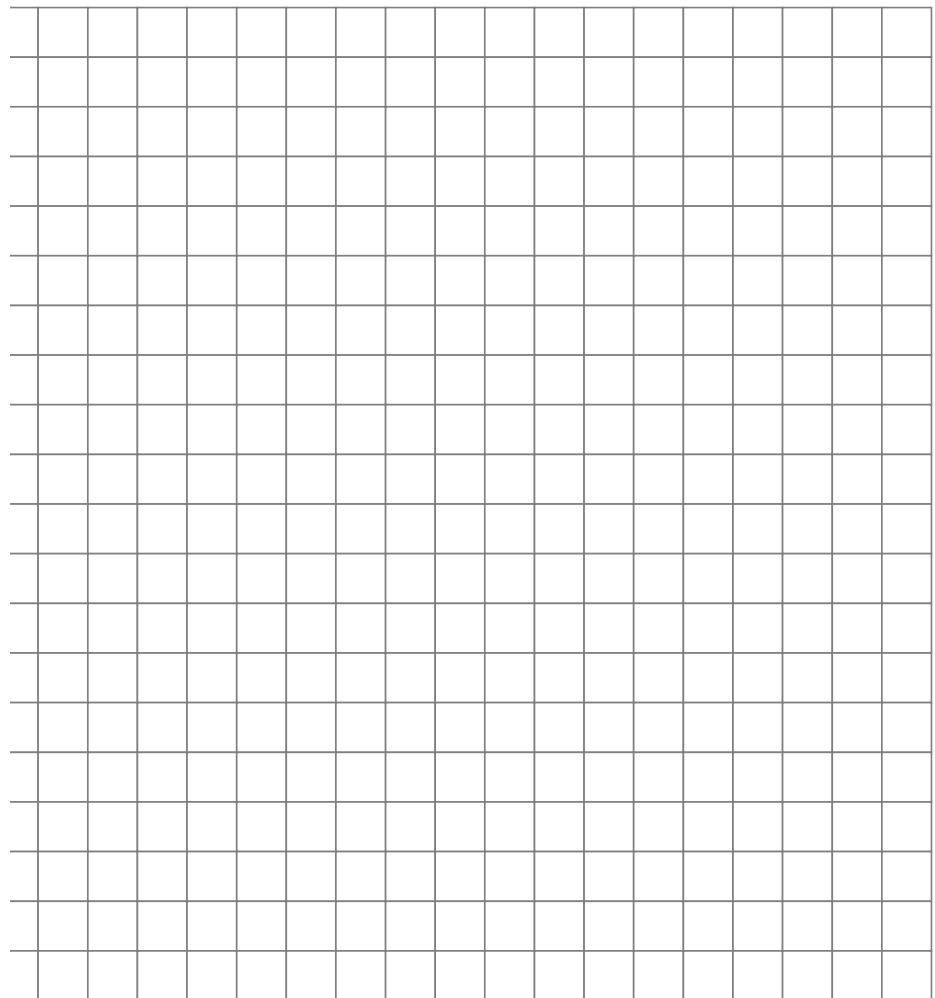
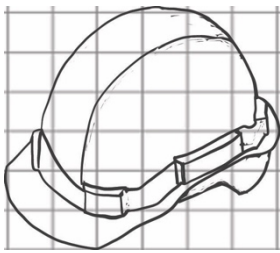




8. Enlarge this shape with a scale factor of 3.



9. Now for a challenge. Magnify this image x 3.



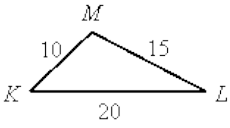
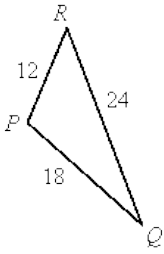
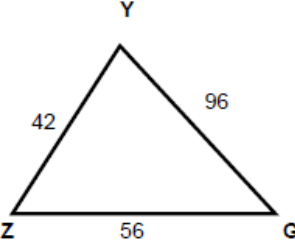
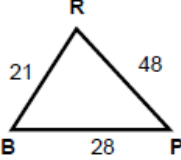
6.4 SIMILAR TRIANGLES

1. State if the two triangles are congruent. If they are, state how you know.

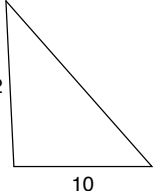
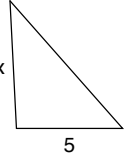
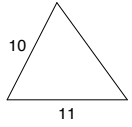
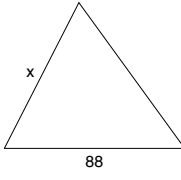
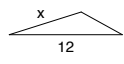
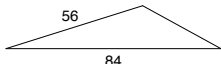
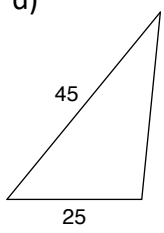
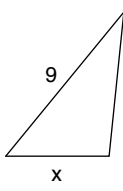
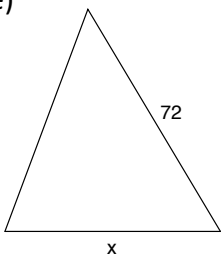
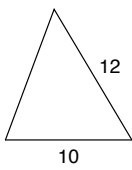
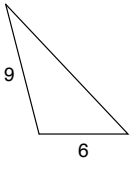
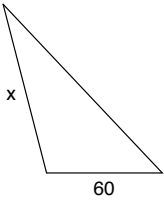
<p>a)</p> <p>_____</p>	<p>b)</p> <p>_____</p>	<p>c)</p> <p>_____</p>
<p>d)</p> <p>_____</p>	<p>e)</p> <p>_____</p>	<p>f)</p> <p>_____</p>
<p>g)</p> <p>_____</p>	<p>h)</p> <p>_____</p>	<p>i)</p> <p>_____</p>

2. State whether or not the following triangles are similar. If not, explain why not. If so, write a similarity statement.

<p>a)</p> <p>Similar? _____</p> <p>Why or why not? _____</p> <p>_____</p> <p>If so, scale factor = _____</p>	<p>b)</p> <p>Similar? _____</p> <p>Why or why not? _____</p> <p>_____</p> <p>If so, scale factor = _____</p>
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<p>c)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Similar? _____                  Why or why not? _____                  _____                  If so, scale factor = _____</p>	<p>d)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Similar? _____                  Why or why not? _____                  _____                  If so, scale factor = _____</p>
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3. Each pair of triangles is similar. Find the missing side. Show all work.

<p>a)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>SF = _____                  x = _____</p>	<p>b)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>SF = _____                  x = _____</p>	<p>c)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>SF = _____                  x = _____</p>
<p>d)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>SF = _____                  x = _____</p>	<p>e)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>SF = _____                  x = _____</p>	<p>f)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>SF = _____                  x = _____</p>

4. Find the measure of each angle indicated. Show your work on the images.

<p>a)</p>	<p>b)</p>
<p>c)</p>	<p>d)</p>
<p>e)</p>	<p>f)</p>
<p>g)</p>	<p>h)</p>

5. A tree 24 feet tall casts a shadow 12 feet long. Brad is 6 feet tall. How long is Brad's shadow? (draw a diagram and solve)

6. A tower casts a shadow 7 m long. A vertical stick casts a shadow 0.6 m long. If the stick is 1.2 m high, how high is the tower?

## UNIT 6 – ANSWER KEY

### SECTION 6.1

- a. 3:1 b. 1:2 c. 3:1 d. 1:3 e. 1:4 f. 2:3 g. 3:5 h. 3:2
- a. 1:3 b. 3:4 c. 4:3 d. 1:2 e. 1:8 f. 4:1
- 

	Ratio x : y format	Ratio Fraction format	Simplified Fraction
<b>Ex.</b> 7 baseballs to 21 balls	<b>7:21</b>	$\frac{7}{21}$	$\frac{1}{3}$
a. 15 mugs to 35 dishes	15:35	$\frac{15}{35}$	$\frac{3}{7}$
b. 4 dogs to 14 animals	4:14	$\frac{4}{14}$	$\frac{2}{7}$
c. 9 plumbers to 15 employees	9:15	$\frac{9}{15}$	$\frac{3}{5}$
d. 18 swimmers to 42 people	18:42	$\frac{18}{42}$	$\frac{3}{7}$

- a.  $\frac{1}{2}$  b.  $\frac{2}{5}$  c.  $\frac{1}{10}$
- a. 3:4:2 b. 1:2:3 c. 4:3:6 d. 3:1:2

### SECTION 6.2

- a. 3, 18, 18 b. 5, 30, 100 c. 7, 42, 20 d. 4, 9, 15 e. 3, 10, 100
- a. 2:3 b. 8:9 c. 1:4 d. 1:2 e. 11:23 f. 3:4 g. 9:10 h. 1:3
- a. 30 teenagers travelled from out of town b. 25 poppy seeds c. 300 mice in 1 km<sup>2</sup>, 1200 mice in 4 km<sup>2</sup>. d. 6 c. almonds, 9 c. raisins, 3 c. choc. chips
- a. 5:1 b. 1:6 c. 15 000 Canuck fans
- a. 2:1 b. 6:1 c. 1.43:1 d. 1.33:1 e. 4.5:1
- a. Week 8 b. Brand B c. Jane

### SECTION 6.3

- 77 cm 2. 10 cm 3 a) 3.6 m b) 1.2 m x 1.5 m c) 2.7 m 4. 1 : 0.6 5. 1 cm:3 m 6. 1 cm:50 m

### SECTION 6.4

- a) not congruent b) Congruent asa c) Congruent sss d) Congruent asa e) not congruent f) not congruent g) Congruent sss h) Congruent sss i) Congruent sas 2. a) similar, 1.5 b) no

c) yes,  $\frac{6}{5}$  d)yes,  $\frac{1}{2}$  3. a) SF =  $\frac{1}{2}$ ,  $x = 6$  b) SF = 8,  $x = 80$  c) SF =  $\frac{1}{7}$ ,  $x = 8$  d) SF =  $\frac{1}{5}$ ,  $x = 5$  e) SF = 6,  $x = 60$  f) SF = 10,  $x = 90$  4 a)  $58^0$  b)  $50^0$  c)  $145^0$  d)  $135^0$  e)  $130^0$  f)  $85^0$  g)  $21^0$  h)  $64^0$  5. 3' 6. 14m