

Math 9 4.2A

Using Two-Term Ratios

A *part-to-part ratio* compares different parts of a group to each other.

The ratio of white circles to grey circles is 6:3 or 6 to 3.

The ratio in lowest terms is 2:1 or 2 to 1.

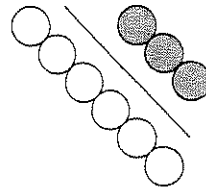
A *part-to-whole ratio* compares one part of a group to the whole group.

The ratio of white circles to the total number of circles is 6:9 or 6 to 9.

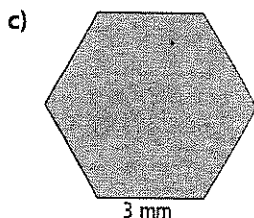
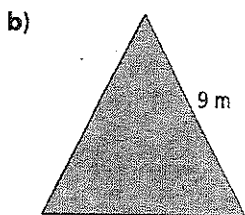
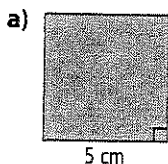
The ratio in lowest terms is 2:3 or 2 to 3.

A part-to-whole ratio can be written as a fraction, a decimal, and a percent.

The ratio of $\frac{\text{grey}}{\text{total}}$ is $\frac{3}{9}$ or $\frac{1}{3}$, $0.\bar{3}$, $33.\bar{3}\%$.



1. For each regular polygon, what is the ratio of one side length to the perimeter? Use ratio notation.



2. Write each ratio in #1 as an equivalent ratio in lowest terms. Show your thinking.

3. Write each ratio in #1 as a decimal and a percent. Show your calculations.

4. Identify the missing value to make an equivalent fraction. Justify your response.

a) $\frac{3}{4} = \frac{\boxed{}}{8}$

b) $\frac{4}{7} = \frac{12}{\boxed{}}$

c) $\frac{\boxed{}}{5} = \frac{3}{15}$

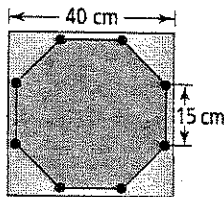
d) $\frac{7}{\boxed{}} = \frac{49}{14}$

5. Set up a proportion for each situation.

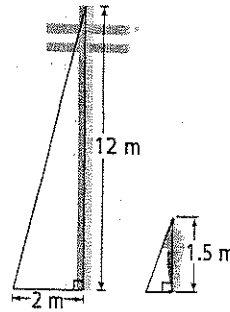
a) On a diagram of a machine part, 2 cm represents 200 cm. The actual length of the part is 100 cm. This distance is 1 cm on the diagram.

b) On a map, 1 cm represents 500 m. Linda wants to ride her bike 3500 m. This distance is 7 cm on the map.

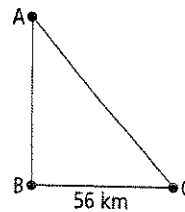
c) A diagram of a hot tub shows the actual 3-m length of one side of the hot tub as 15 cm. The 8-m length of the square deck around the hot tub is shown as 40 cm.



6. A telephone pole that is 12 m tall casts a shadow that is 2 m long. What is the length of the shadow cast by a student who is 1.5 m tall?



7. The distance between Town B and Town C is 56 km. The distance shown on the map is 7 cm in length. What is the actual distance between Town A and Town C if it is represented on the same map by a length of 12.5 cm?



8. Solve each proportion for the letter given. Round answers to the nearest tenth.

a) $\frac{2}{3} = \frac{N}{12}$

b) $\frac{15}{1} = \frac{45}{Y}$

c) $\frac{9}{A} = \frac{5}{3}$

d) $\frac{X}{5} = \frac{8}{2}$

e) $M:6=7:4$	f) $2:3=R:17$
g) $10:3=4:C$	h) $7:D=1:6$
i) $X:3=0.5:9$	j) 15 is to 1 as 45 is to Y
k) 2 is to 3 as N is to 12	l) 9 is to A as 5 is to 3

9. Solve each problem. Round answers to the nearest hundredth (2 decimals).

- 4 litres of paint are needed to paint 64 fence posts. How many posts can be painted with 5 litres of paint?
- An engine uses a 40:1 mixture of gas to oil. How much oil should be added to 5 litres of gasoline?
- If a car travels 400 km on 52 litres of gas, how many litres will it take to travel 250 km?

Key:

1a) $\frac{5}{20}$

b) $\frac{9}{27}$

c) $\frac{3}{18}$

2a) $\frac{1}{4}$

b) $\frac{1}{3}$

c) $\frac{1}{6}$

3a) 0.25, 25%

b) $0.\bar{3}$, 33. $\bar{3}$ %

c) $0.1\bar{6}$, 16. $\bar{6}$ %

4a) 6

b) 21

c) 1

d) 2

5a) $\frac{2}{200} = \frac{1}{100}$

B) $\frac{1cm}{500m} = \frac{7cm}{3500m}$

c) $\frac{15cm}{3m} = \frac{40cm}{8m}$

6) 0.25m

7) 100km

8a) 8

b) 3

c) 5.4

d) 20

e) 10.5

f) $11.\bar{3}$

g) 1.2

h) 42

i) $0.1\bar{6}$

j) 3

k) 8

l) 5.4

9a) 80 posts

b) 0.13 L

c) 32.5 L