Lesson 3

1 Write down the expressions by filling in the diagrams:

? =

| I | II |
| 3 | 5 |

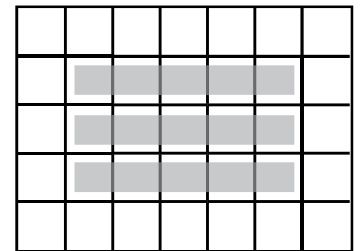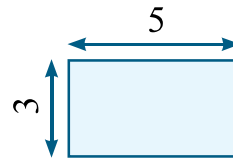a) There are 5 books on a shelf. There are 3 books on another shelf. How many books are on both shelves?
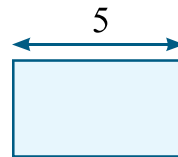
3 + 5
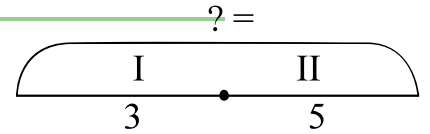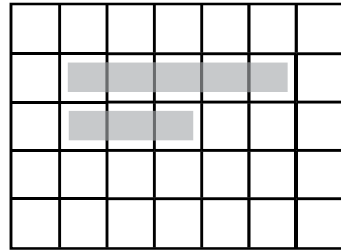
b) There are *m* books on a shelf. There are 3 books on another shelf. How many books are on both shelves?

? =

| I | II |
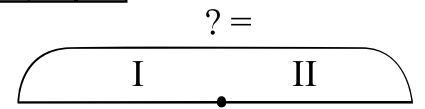
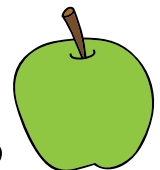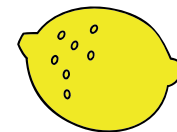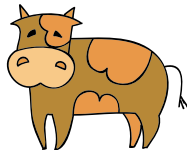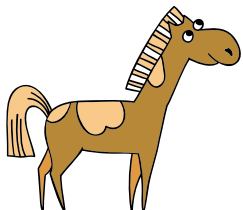c) There are 5 books on each of 3 shelves. How many books are on these shelves in total?

5

3

d) There are 5 books on each of *q* shelves. How many books are on these shelves in total?

5

2 Find a word that describes each group of objects below:

11
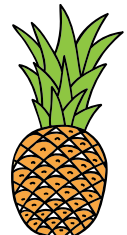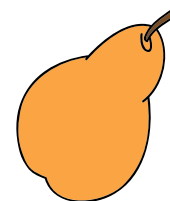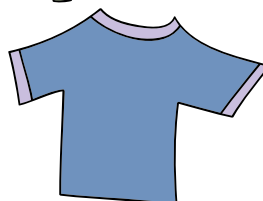
Sets

3

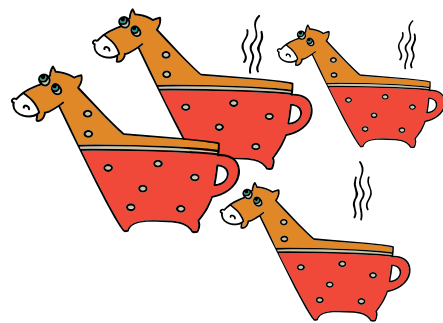a) What do you call a group of birds flying together?

_____

b) What do you call a group of fish swimming together?

_____

c) What is a bouquet?

_____

d) What is a herd?

_____

e) Can you say "a herd of cups"?

_____

f) Can you say a "bouquet of cats"?

_____
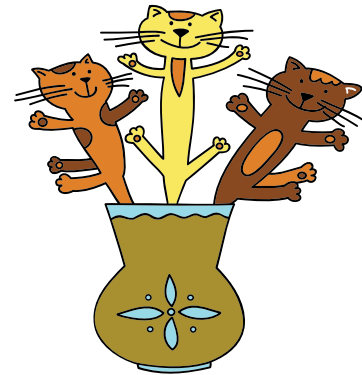
In mathematics, when objects are grouped together they are called a **set**.	All objects or living things included in a set are called **elements** or **members** of that set.

4

a) Math, English, Science belong to a set of _____

Another element of this set is _____

b) A penny, a quarter, a nickel belong to a set of _____

Another element of this set is _____

c) A Cucumber, a pepper, an onion belong to a set of _____

Another element of this set is _____

d) Make your own example of a set:

A set of _____ includes _____.

5 Define the following sets by stating a common property of its elements:

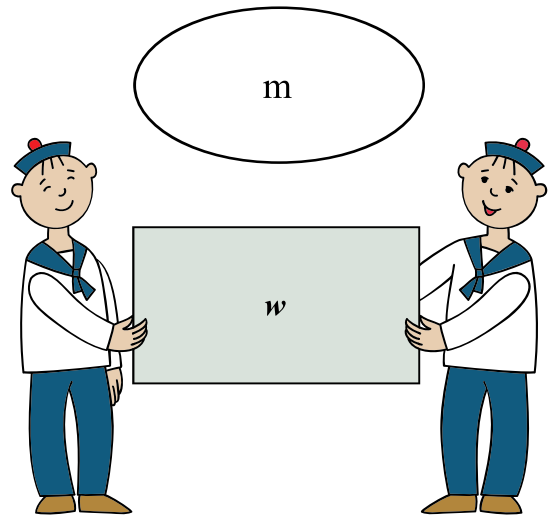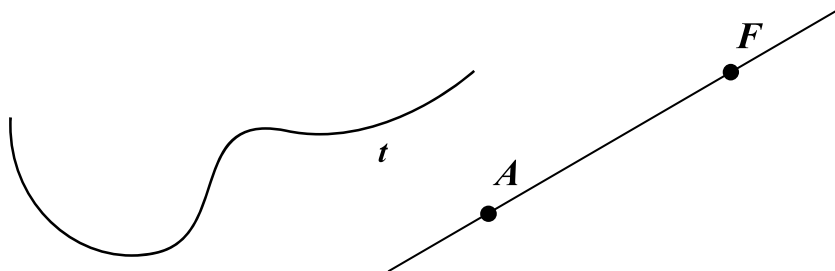a) {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}   A set of _____

b) {0, 2, 4, 6, 8}   A set of _____

c) {a, e, i, o, u}   A set of _____

Sets in Geometry

All shapes are made of points.
Therefore, any shape is a **set of points.**

m

F

t

A

w

6 Look at the shapes above and answer the following questions:

a) How many points are labeled on straight line *AF*?   _____

b) Are there any other points that belong to the line *AF*?   _____

c) Label two more points on the line *AF*. Name these points *P* and *N*.

d) The set of labeled points on the straight line *AF* is {   ,   ,   ,   }

e) Are all points on the straight line *AF* labeled?

f) The total number of all points on the straight line *AF* is _____

g) The shapes *t*, *m*, and *w* consist of _____. Their quantity is _____ .
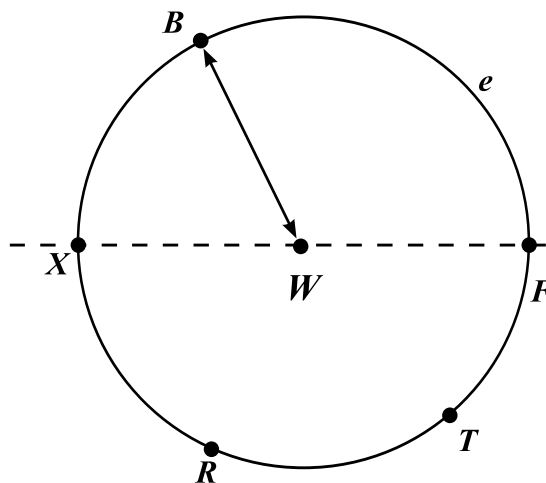
13

The Circle

Besides the straight line, the circle is the most important shape in geometry.

A **circle** is a set of all points that are the same distance from its **center**.

Example: Any point of the curve *e* is 3 cm away from the *W*.

Therefore, curve *e* is called a circle with the center at point *W* and radius 3 cm:

$$e = \text{Circ}(W, 3 \text{ cm})$$

---

7 The distance between points *A* and *B* is usually denoted like this: |*AB*|.

a) What is the distance between the points *W* and *X*? |*WX*| = _____

b) What is the distance between the points *W* and *F*? |*WF*| = _____

c) What is the distance between the points *W* and *R*? |*WR*| = _____

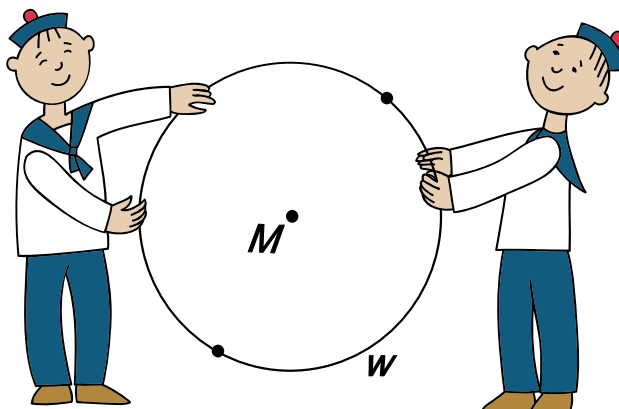d) What is the distance between the points *W* and *T*? |*WT*| = _____

---

8 Curve *w* is a circle with center at point *M*. Measure its radius and write the circle notation for the curve *w*.

w = Circ (*M*, _____cm)

Name the two labeled points on the circle with letters *N* and *T*.

|**MT**| = _____ cm
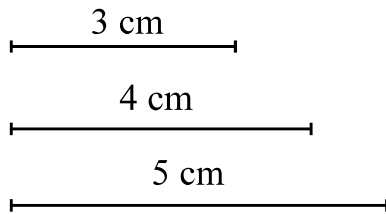|**MN**| = _____ cm

9 Use a compass to plot the following:

a) circle **m** = Circ(**A**, 4 cm)

b) circle **v** = Circ(**A**, 5 cm)

c) circle **w** = Circ(**B**, 5 cm)

d) circle **u** = Circ(**C**, 3 cm)

Label each circle.

3 cm

4 cm

5 cm

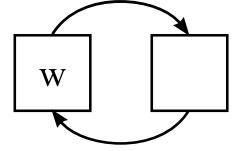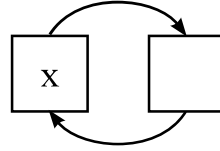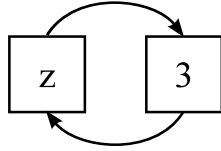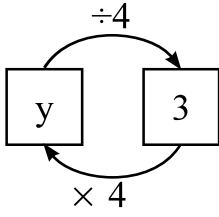The tool for plotting circles is called a **compass**. Its purpose is to keep a fixed distance between its graphing head and the center of the plotted circle.

•**A**

•**B**

•**C**
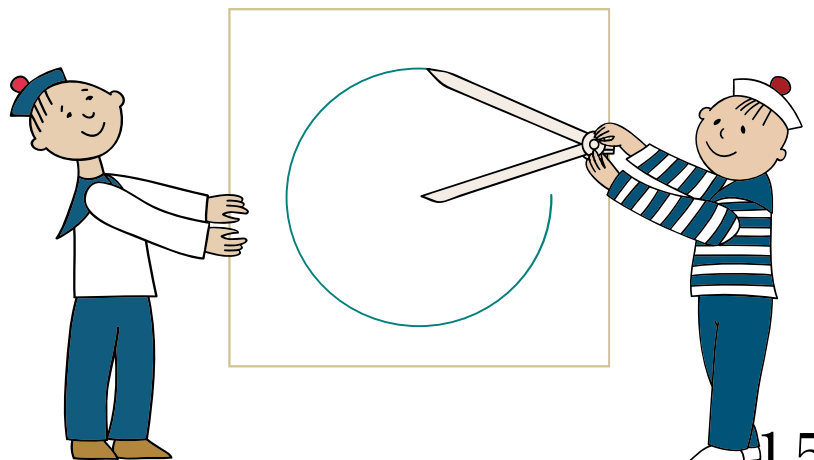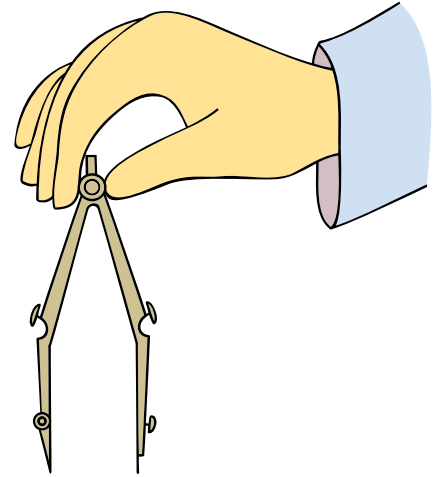
10 Solve the equations by analyzing the operations performed. Check your answers.

÷4

| y | | 3 |

× 4

| z | | 3 |

| x | | |

| w | | |

$y \div 4 = 3$

$y =$

$y =$

$z - 4 = 3$

$x + 9 = 13$

$w \times 9 = 72$

The Four Brothers

11 The four mice are brothers. Their names are Jake the Mouse, Little Joe, Pop Eye, and Foxy Tail.

Foxy Tail always lies,
Little Joe always tells the truth, and
Pop Eye and **Jake the Mouse** tell either the truth or lie.

a) If you ask Little Joe how many tails he has – one or two, what will he answer?

b) If you ask Foxy Tail if he has any brothers, what will he answer?

Can they say the following? Explain.

c) *LJ:* I never lie.

d) *FT:* I never lie.