Hundred's Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Base-10 blocks are useful for solving problems, but sometimes they are not available. You can draw pictures instead. The pictures sometimes used in this book to show base-10 blocks are shown in the margin.

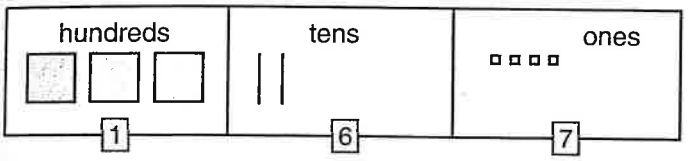
Pictures of base-10 blocks show how the trade-first method works.

Base-10 Block	Shorthand Picture
cube	
long	
flat	
big cube	

Example $324 - 167 = ?$

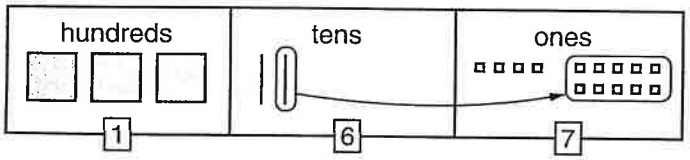
Use pictures of base-10 blocks to model the larger number, 324.

Write the number to be subtracted, 167, beneath the block pictures.

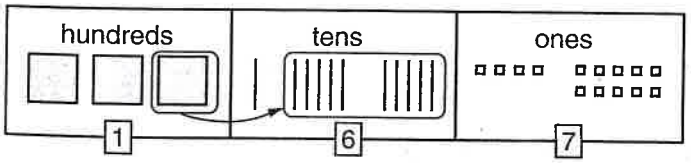


100s	10s	1s
3	2	4
− 1	6	7

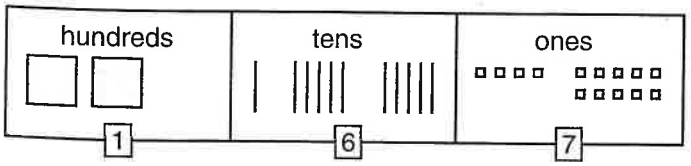
Think: Can I remove 7 cubes from 4 cubes? No
Trade 1 long for 10 cubes.



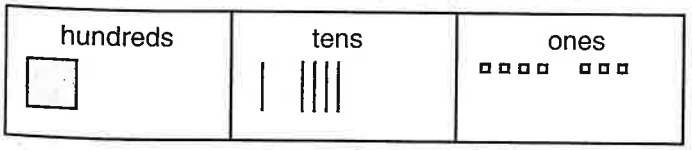
Think: Can I remove 6 longs from 1 long? No
Trade 1 flat for 10 longs.



After all of the trading, the blocks look like this:



Now subtract in each column. The difference is 157.



100s	10s	1s
3	2	4
− 1	6	7
1	**5**	**7**

#	Rule	Examples
2	If the number is even, it's true, it is divisible by 2...	9<u>8</u> 10<u>6</u> 3,45<u>4</u>
3	Add the digits to see, if it is divisible by 3...	318 → 3 + 1 + 8 = 12 12 ÷ 3 = 4
4	Divide the last 2 digits by 4, & you will get 4, for sure...	3<u>64</u> → 64 ÷ 4 = 16 4,0<u>24</u> → 24 ÷ 4 = 6
5	If the number ends in 5 or 0, 5 will definitely be your hero...	32<u>5</u> 1,22<u>0</u>
6	If you already have 2 and 3, you will get the 6 for free...	84<u>6</u> → Even # divides by 2 8 + 4 + 6 = 18 18 divides by 3
8	If the last 3 digits divide by 8, you will know 8 works great...	1,<u>064</u> → 64 ÷ 8 = 8 23,<u>128</u> → 128 ÷ 8 = 16
9	Adding the digits is just fine, if it is divisible by 9...	927 → 9 + 2 + 7 = 18 18 ÷ 9 = 2
10	If a 0 comes at the end, you'll feel good about the 10...	13<u>0</u> 7,95<u>0</u> 34,64<u>0</u>

Units of Length

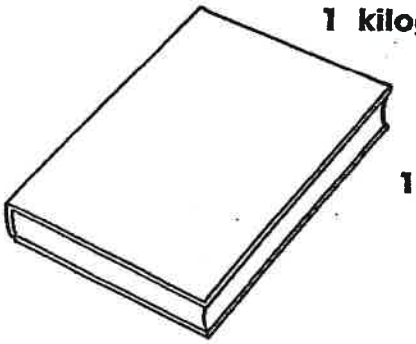
Customary Units	Metric Units
1 foot (ft) (about the length of a sheet of notebook paper) = 12 inches (in) (one ruler)	1 centimeter (cm) (about the width of your pinky finger) = 10 millimeters (mm) (the smallest little lines on the metric side of a ruler)
1 yard (yd) (about the length of a baseball bat) = 3 feet or 36 inches (3 rulers)	1 decimeter (dm) = 10 centimeters (cm)
	1 meter (m) (about the width of a door) = 100 centimeters (close to 3 rulers, but not exactly)

Units of Capacity

Customary Units	Metric Units
1 cup = 8 ounces	1 milliliter = a few drops
1 pint = 2 cups	1 liter (1/2 of a 2-liter bottle) = 1,000 milliliters
1 quart = 4 cups or 2 pints	
1 gallon = 4 quarts = 8 pints = 16 cups	

Units of Weight	Units of Mass
1 ounce (oz) = about the weight of a slice of cheese	1 gram (g) = the mass of a dollar bill
1 pound (lb) (about the weight of a lunchbox) = 16 ounces	1 kilogram (kg) (about the mass of a pair of running shoes) = 1,000 grams
1 ton = 2,000 pounds	

1 kilogram (kg) = 1,000 grams (g)

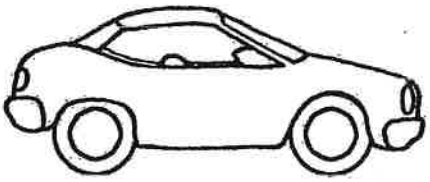


1 kg

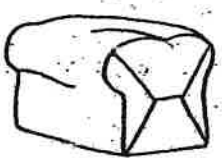
math book
about 1 kilogram

paper clip
about 1 gram

1 pound (lb) = 16 ounces (oz)
1 ton (T) = 2,000 pounds



about 1 ton

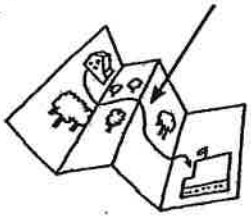


about 1 pound

about 1 ounce

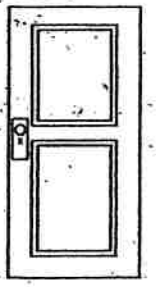
1 meter (m) = 100 centimeters (cm)
1 kilometer (km) = 1,000 meters

1 km



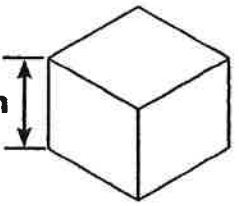
about 1 kilometer

1 m



about 1 meter

1 cm



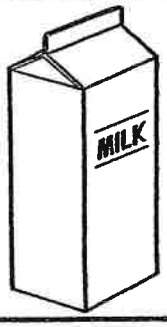
about 1 centimeter

1 foot (ft) = 12 inches (in.)

1 yard (yd) = 3 ~~feet~~ or 36 inches

1 mile (mi) = 1,760 yards or 5,280 feet

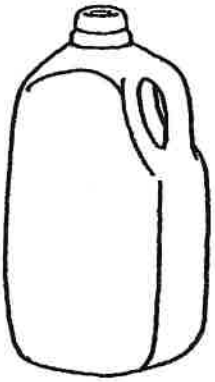
1 liter (L) = 1,000 milliliters (mL)



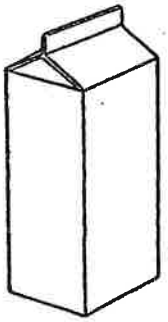
milk carton
1 liter

eyedropper
1 milliliter

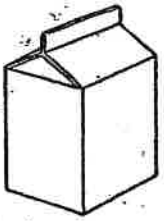
1 pint (pt) = 2 cups (c)
1 quart (qt) = 2 pints or 4 cups
1 gallon (gal) = 4 quarts or 8 pints



1 gallon

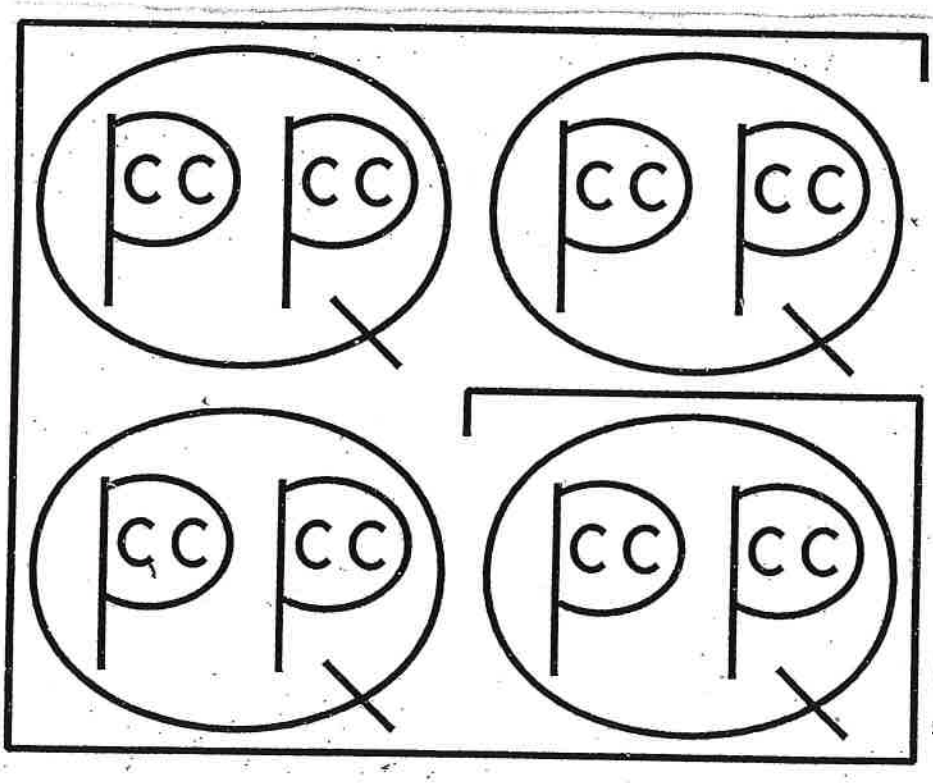


1 quart

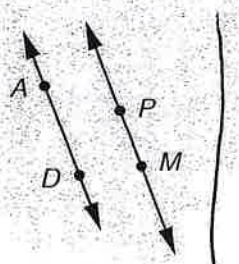


1 pint

1 cup

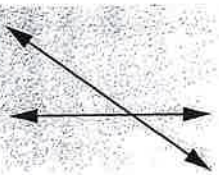


Parallel Lines and Segments

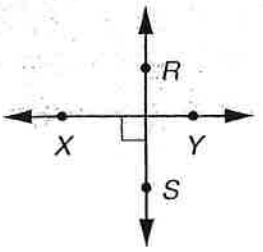


parallel lines
$\overleftrightarrow{AD} \parallel \overleftrightarrow{PM}$

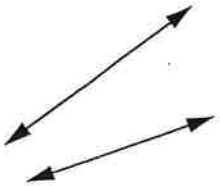
parallel segments
$\overline{FE} \parallel \overline{JK}$



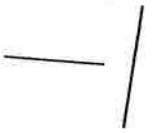
intersecting lines



perpendicular lines
$\overleftrightarrow{RS} \perp \overleftrightarrow{XY}$

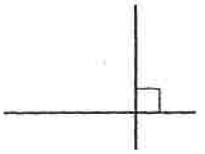


lines not parallel



segments not parallel

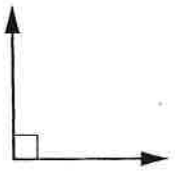
intersecting segments



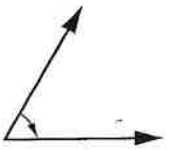
perpendicular segments

Classifying Angles

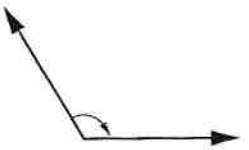
Angles may be classified according to size.



A **right angle** measures 90°.



An **acute angle** measures between 0° and 90°.



An **obtuse angle** measures between 90° and 180°.

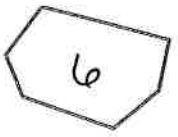
Convex Polygons

A **convex** polygon is a polygon in which all the sides are pushed outward. The polygons below are convex.

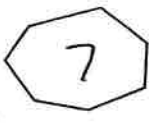
triangle

quadrangle (or quadrilateral)

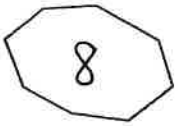
pentagon



hexagon

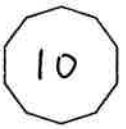


heptagon



octagon

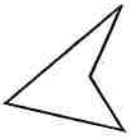
nonagon



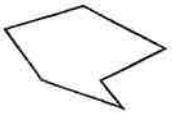
decagon

Nonconvex (Concave) Polygons

A **nonconvex,** or **concave,** polygon is a polygon in which at least two sides are pushed in. The four polygons at the right are nonconvex.

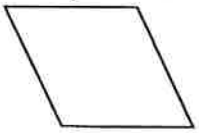
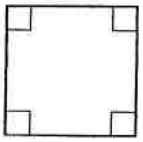


quadrangle (or quadrilateral)

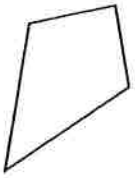
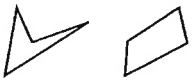


hexagon

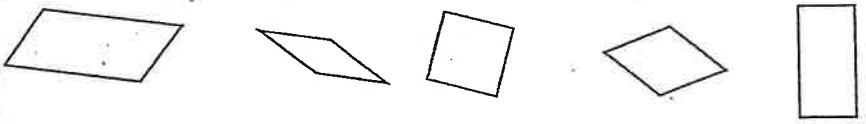
Quadrangles that Are Parallelograms

rectangle		**Rectangles** are parallelograms. A rectangle has 4 right angles (square corners). The sides do not all have to be the same length.
rhombus		**Rhombuses** are parallelograms. A rhombus has 4 sides that are all the same length. The angles of a rhombus are usually not right angles, but they may be.
square		**Squares** are parallelograms. A square has 4 right angles (square corners). Its 4 sides are all the same length. All squares are rectangles. All squares are also rhombuses.

Quadrangles that Are NOT Parallelograms

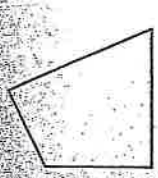
trapezoid		**Trapezoids** have exactly 1 pair of parallel sides. The 4 sides of a trapezoid can all have different lengths.
kite		A **kite** is a quadrangle with 2 pairs of equal sides. The equal sides are next to each other. The 4 sides cannot all have the same length. (A rhombus is not a kite.)
other		Any closed figure with 4 sides that is not a parallelogram, a trapezoid, or a kite.

Figures that Are Parallelograms

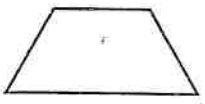


Opposite sides are parallel in each figure.

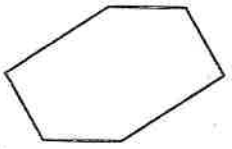
Figures that Are NOT Parallelograms



No parallel sides.



Only 1 pair of parallel sides.



3 pairs of parallel sides. A parallelogram must have exactly 2 pairs of parallel sides.

Parallelogram – Has 2 pairs of parallel sides

Regular Polygon – Has = sides & = angles

Quadrangle (Quadrilateral) – Has 4 sides & 4 angles

Polygon – Has no curved edges, does not cross, has no open sides

Convex – All corners (vertices) point out.

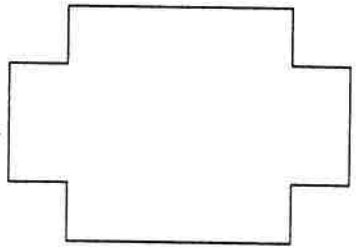
Concave – At least one corner (vertex) points in (or caves in).

Polygons

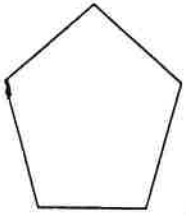
They ALL have:

- 3 sides or more
- straight sides - no curves
- no open edges - sides connect
- no intersections (through corners)

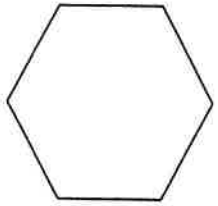
Polygons that do NOT have 4 sides



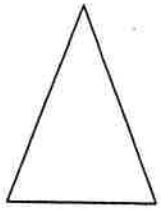
Pentagon



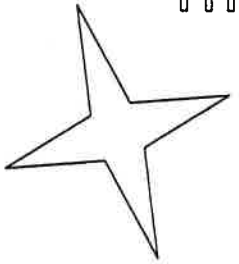
Hexagon



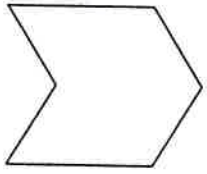
Triangle



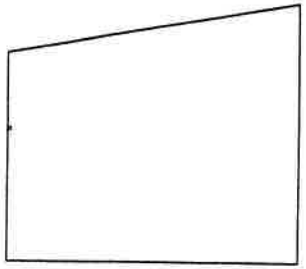
Concave Octagon



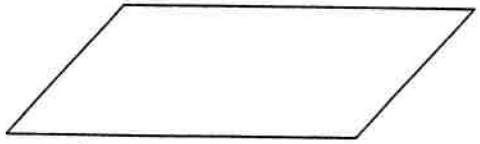
Concave Hexagon



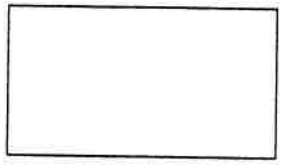
Quadrangles or Quadrilaterals



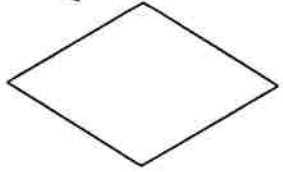
Parallelogram



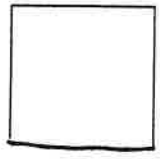
Rectangle



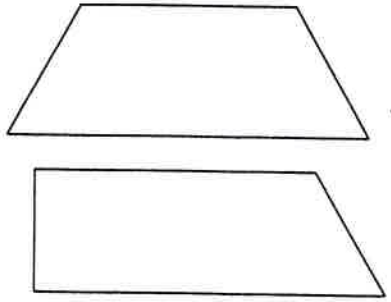
Rhombus



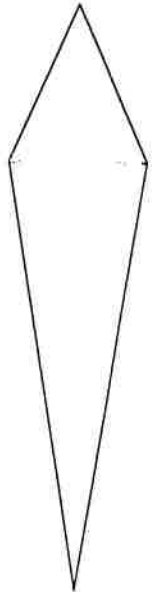
Square



Trapezoids



Kite

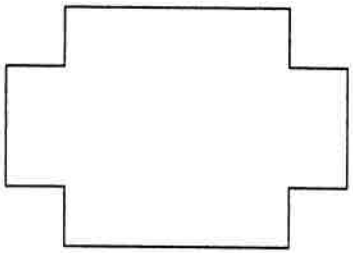


Polygons

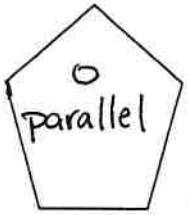
They ALL have:

- 3 sides or more
- straight sides - no curves
- no open edges - sides connect
- no intersections (through corners)

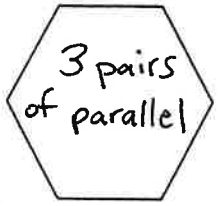
Polygons that do NOT have 4 sides



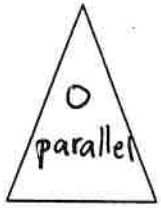
Pentagon - 5 sides



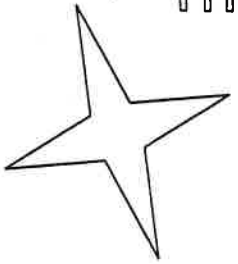
Hexagon - 6 sides



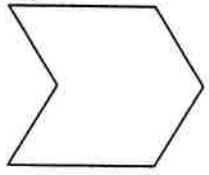
Triangle
3 sides



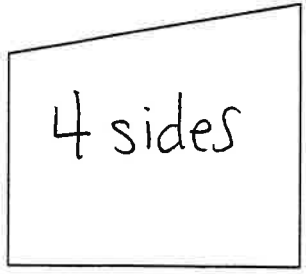
Concave Octagon
8 sides



Concave Hexagon
6 sides

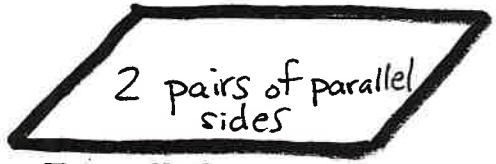


Quadrangles or Quadrilaterals

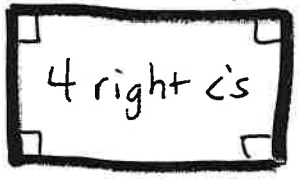


Convex quadrangle (all corners poke out)

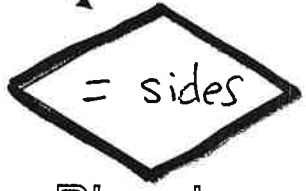
Parallelogram



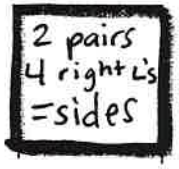
Rectangle



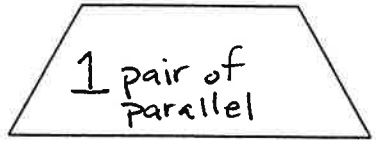
Rhombus

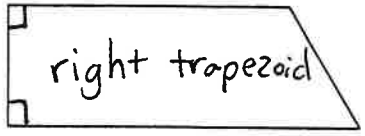


Square

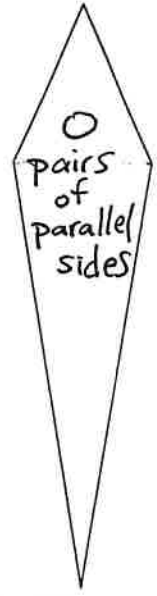


Trapezoids



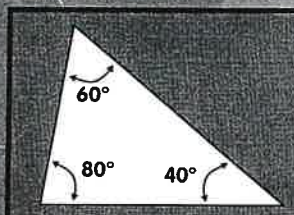


Kite



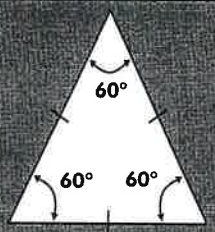
Game 30

Triangles



Acute Triangle

All angles are less than 90°.

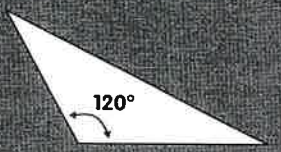


Equilateral Triangle

Three equal sides.
Three equal angles, always 60°.

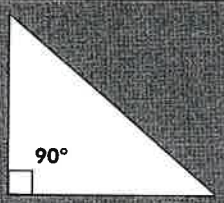
Isosceles Triangle

Two equal sides.
Two equal angles.



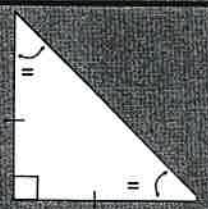
Obtuse Triangle

Has an angle more than 90°.



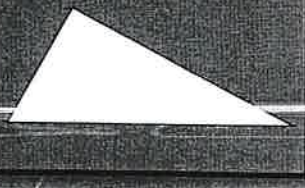
Right Triangle

Has a right angle (90°).



Right Isosceles Triangle

Has a right angle (90°), and
two equal angles.



Scalene Triangle

No equal sides.
No equal angles.

Match Mine: Mathematics
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