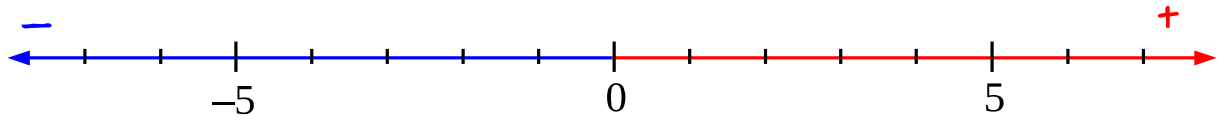


Lesson № 23

1 Calculate:



$2 + 4 =$

$2 + (-4) =$

$2 - 4 =$

$2 - (-4) =$

$(-3) + 1 =$

$(-3) + (-1) =$

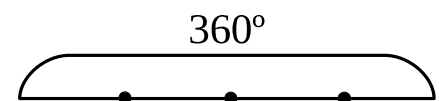
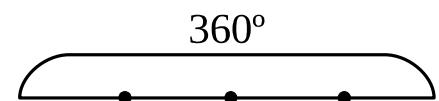
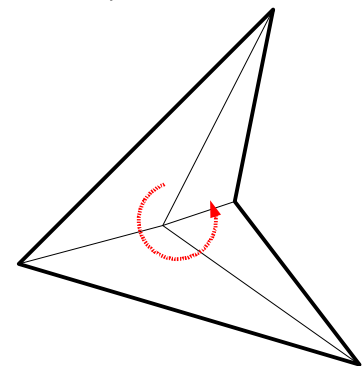
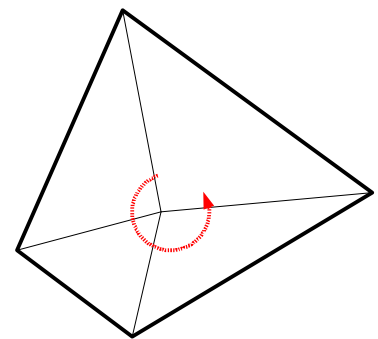
$(-3) - 1 =$

$(-3) - (-1) =$

Angle sum of a Quadrilateral.

- Any quadrilateral can be split into four triangles
- Angle sum of each of these triangles equals 360°
- The angles of a quadrilateral are combinations of the angles of these four triangles (except the angles sharing the common vertex).
- These “inner” angles that add up to 360° must be subtracted

$$4 \times 180^\circ - 360^\circ = 360^\circ$$



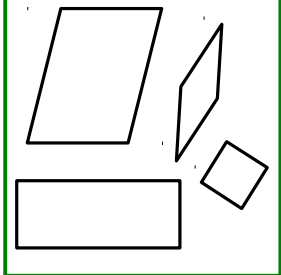
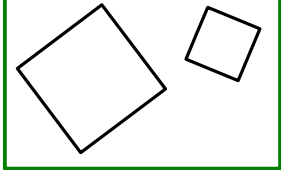
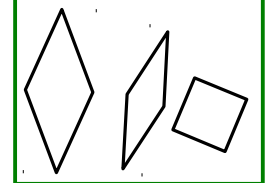
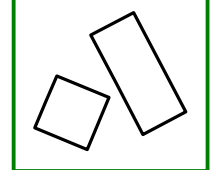
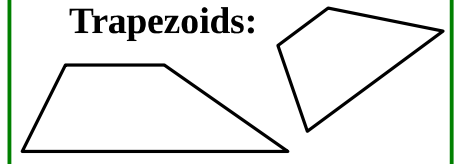
2 A. Is it possible to have a quadrilateral with exactly 3 right angles?

B. Three angles of a quadrilateral equal 75° , 90° , and 110° . What is the 4th angle of the quadrilateral?

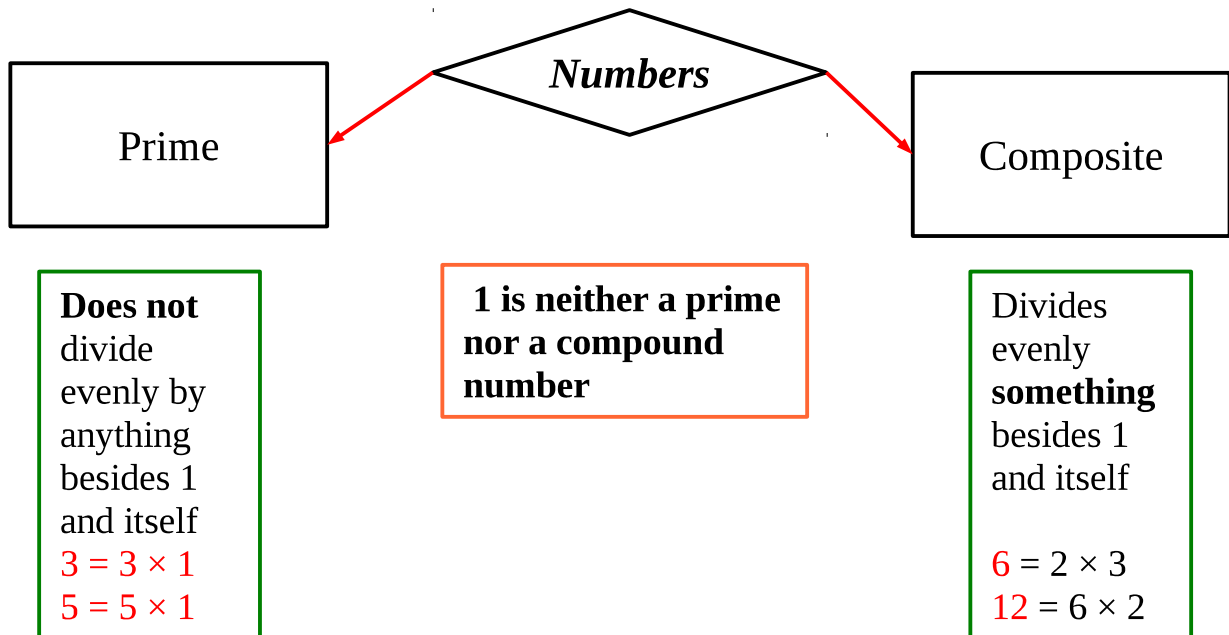
3

Draw a Venn diagram for:

- Square, Parallelogram, Rectangle
- Triangle, Parallelogram , Square, all shapes
- Rectangle , Rhombus, Trapezoid, Parallelogram
- Quadrilateral, Rectangle, Rhombus, Trapezoid, Parallelogram, Square
- Triangle, Parallelogram , Square, Circle, all shapes

Parallelograms:**Squares:****Rhombuses:****Rectangles:****Trapezoids:**

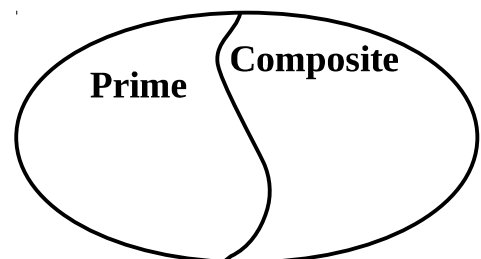
Prime Numbers and Composite Numbers



Note, dividing evenly means **without** producing a remainder or a fraction!

4 Place the numbers from the set **R** into the Venn Diagram.

$$R = \{2, 3, 4, 5, 6, 7, 8, 9, 10\}$$



Factors are the numbers we multiply together to get another number. Factors divide the number evenly.

Example: factors of 56

$$56 : 2 = 28 \qquad 56 : 14 = 4$$

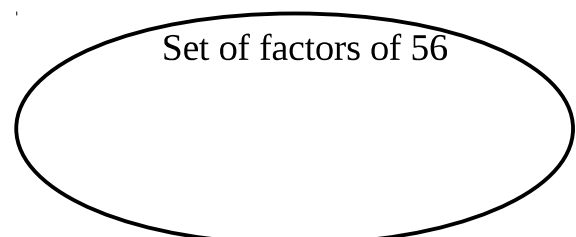
$$56 : 4 = 14 \qquad 56 : 28 = 2$$

$$56 : 8 = 7 \qquad 56 : 1 = 56$$

$$56 : 7 = 8 \qquad 56 : 56 = 1$$

$$56 = 7 \times 8$$

Factors: 7 and 8



A **Prime Number** has only two factor: one and itself.

5

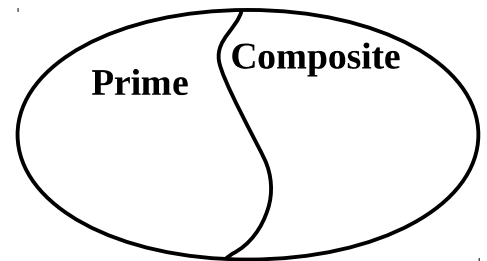
Sort the following numbers into the Venn Diagram. List at least one of the factors for each number. DO NOT use trivial factors for composite numbers.

$$S = \{3, 4, 5, 6, 7, 8, 9, 10\}$$

$$3 : \underline{\quad} = \underline{\quad} \quad 4 : \underline{\quad} = \underline{\quad} \quad 5 : \underline{\quad} = \underline{\quad}$$

$$6 : \underline{\quad} = \underline{\quad} \quad 7 : \underline{\quad} = \underline{\quad} \quad 8 : \underline{\quad} = \underline{\quad}$$

$$9 : \underline{\quad} = \underline{\quad} \quad 10 : \underline{\quad} = \underline{\quad}$$



6

Which numbers represented as products of several factors below?

$$3 \times 2 \times 2 =$$

$$7 \times 3 \times 2 =$$

$$3 \times 5 \times 4 \times 2 =$$

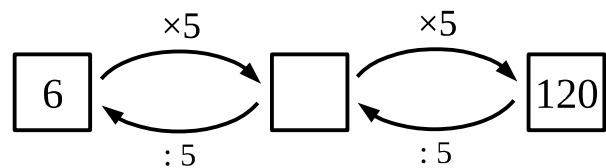
$$5 \times 2 \times 2 =$$

$$6 \times 5 \times 3 =$$

$$3 \times 5 \times 4 \times 10 =$$

Connection between factors and operations.

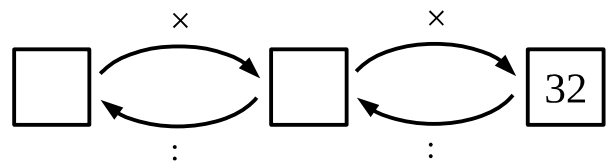
$$6 \times 5 \times 4 = 120$$



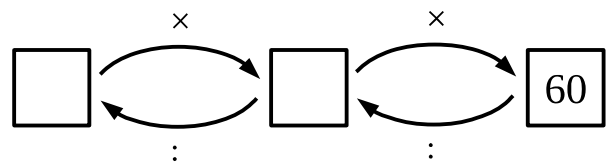
7

Present the following products as sequences of operations:

$$32 = 2 \times 4 \times \underline{\quad}$$



$$60 = \underline{\quad} \times 5 \times \underline{\quad}$$



8 Write the result without cumbersome calculations:

$128 \times 54 : 54 =$

$329 \times 21 : 21 =$

$29 \times 7 : 7 =$

$56 \times 29 : 56 =$

$71 \times 127 : 71 =$

$562 \times 13 : 562 =$

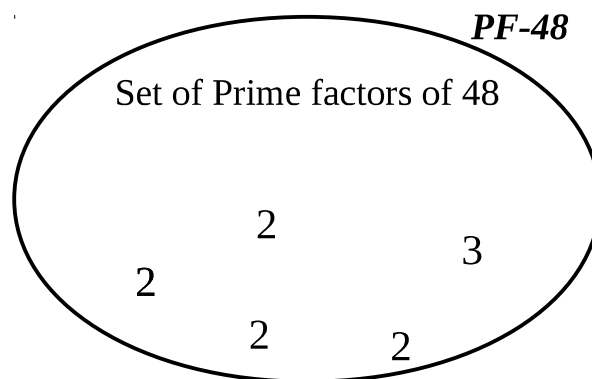
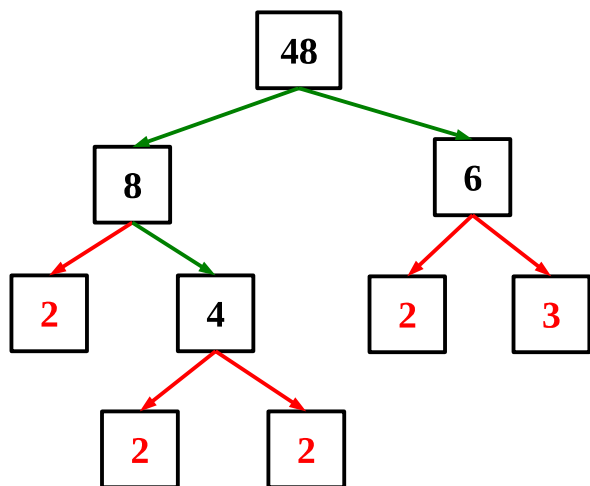
$2 \times 272 \times 4 : 272 =$

$4 \times 4 \times 319 : 319 =$

$97 \times 4 \times 5 : 97 =$

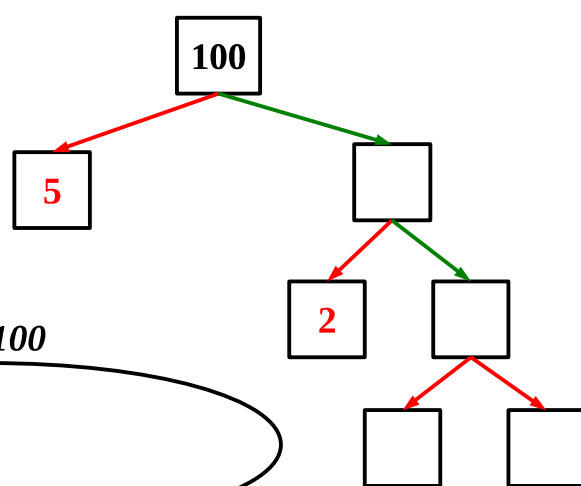
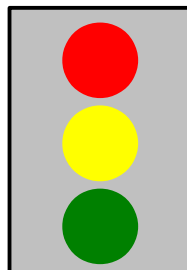
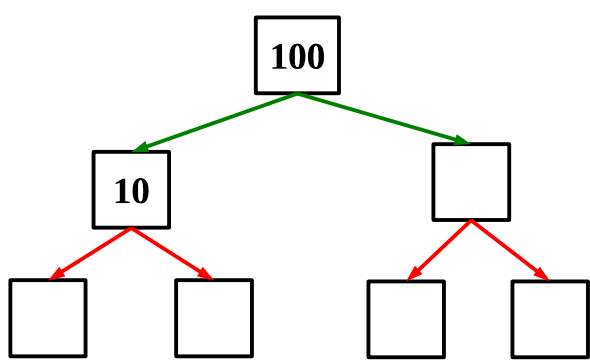
Some factors are prime numbers; some are not.
 Factors that are prime numbers are called **Prime Factors**

9 Analyze a tree of factors for number 48.

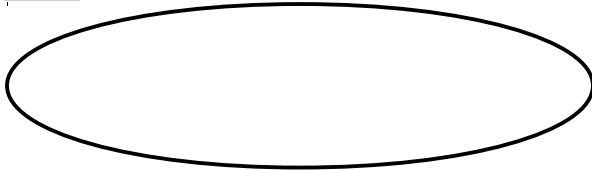


$48 = 2 \times 2 \times 2 \times 2 \times 3$

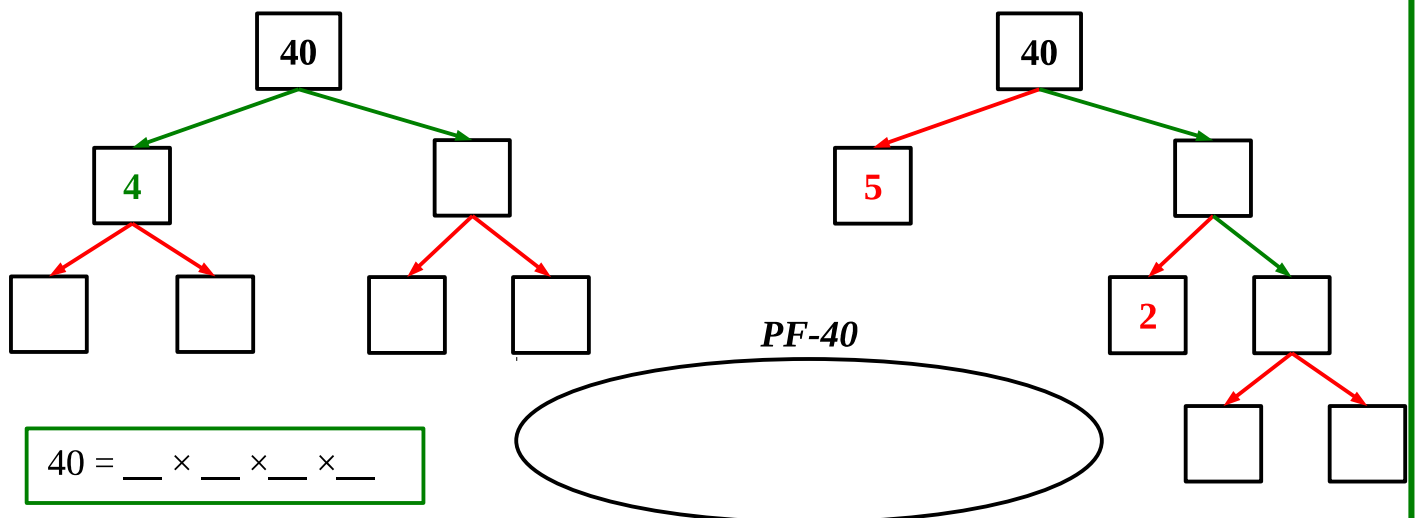
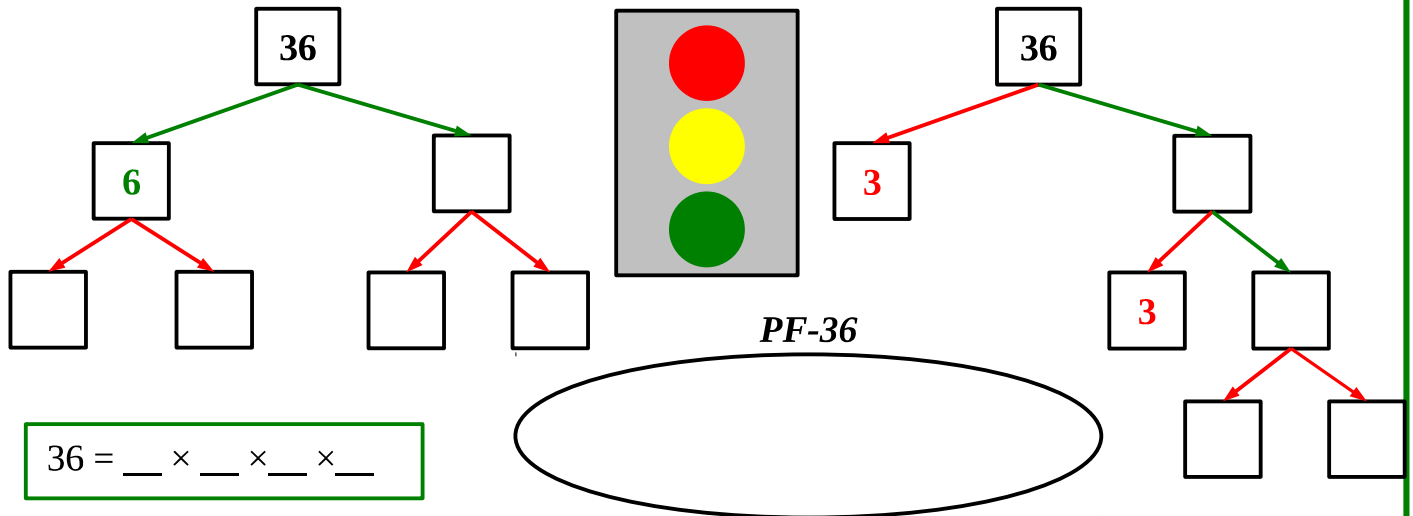
10 Depending on the first step the view of your tree might be different. See how the tree depends on the first step:



$100 = _ \times _ \times _ \times _$



- 11 Compare different factor trees for the composite numbers below. Do various trees produce different sets of prime factors?



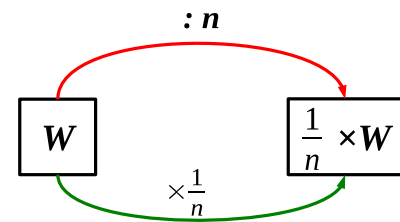
Every number can be represented as a product of prime factors in a **unique** way.

This unique set of prime factors of the number is called its **Prime Factorization**.

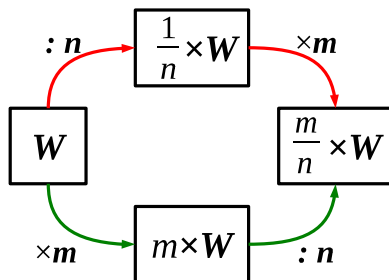
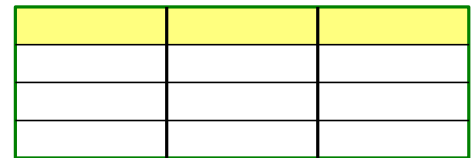
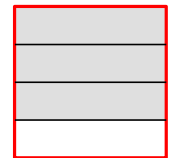
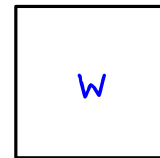
Fraction of a number.

Reminder: to find one n -th of a number one has to multiply this number by $\frac{1}{n}$ or divide the number by n :

For example: $60 \times \frac{1}{4} = 60 : 4 = 15$



To find a random fraction $\frac{m}{n}$ of a number W its $\frac{1}{n}$ fraction has to be taken m times:



$\frac{m}{n}$ fraction of a number W equals the $\frac{1}{n}$ fraction of the number $W \times m$

12 Calculate:

$$60 \times \frac{1}{3} = 60 : 3 =$$

$$90 \times \frac{1}{3} = 90 : 3 =$$

$$15 \times \frac{1}{3} = 15 : 3 =$$

$$60 \times \frac{2}{3} = 60 : 3 \times 2 =$$

$$20 \times \frac{3}{4} = 20 : 4 \times 3 =$$

$$25 \times \frac{2}{5} = 25 : 5 \times 2 =$$

$$12 \times \frac{5}{6} = 12 \times 5 : 6 =$$

$$14 \times \frac{3}{7} = 14 : 7 \times 3 =$$

$$8 \times \frac{3}{4} = 8 \times 3 : 4 =$$

$$20 \times \frac{2}{5} = 20 : \square \times \square =$$

$$12 \times \frac{3}{4} = 12 \times \square : \square =$$

$$6 \times \frac{2}{3} = 6 : \square \times \square =$$