Objective:

to use the order of operations to solve problems

Key Ideas

Order of Operations

P E M D A S

An agreed upon set of rules so there is only one answer to a given problem.

1. Parentheses (and other grouping symbols)
2. EXponents
3. multiplication & division (from left to right)
4. addition & subtraction (from left to right)

Example 1: Show and name the different types of grouping symbols.

{ } braces ( ) Parentheses —— large fractions

[ ] brackets | | absolute value

Example 2: What is the difference between 6^2 and $6 \cdot 2$?

$6 \cdot 6 = 32$ $6 \cdot 2 = 12$

Example 3: Simplify using the order of operations.

a) $4+8\div2+6\cdot3$

$4+4+6\cdot3$

$4+4+18$

$8+18$

$\boxed{26}$

b) $6\cdot(3+2)\div15$

$6\cdot5\div15$

$30\div15$

$\boxed{2}$

c) $14+16\cdot2^3-8\div2^2$

$14+16\cdot8-8\div4$

$14+128-8\div4$

$14+128-2$

$142-2=\boxed{140}$

d) $14\div[3(8-2)-11]$

$14\div[3(6)-11]$

$14\div[18-11]$

$14\div7$

$\boxed{2}$

e) $2[(12-3)\div 3\cdot 2]-7$

$2[9\div 3\cdot 2]-7$

$2[3\cdot 2]-7$

$2(6)-7$

$12-7$

$\boxed{5}$

f) $2+\left(\frac{6+30}{9-3}\right)$

$2+\left(\frac{36}{6}\right)$

$2+6$

$\boxed{8}$

g) $3+4[13-2(6-3)]$

$3+4[13-2(3)]$

$3+4[13-6]$

$3+4(7)$

$3+28$

$\boxed{31}$

h) $5(3^2+2)-2(6^2-5^2)$

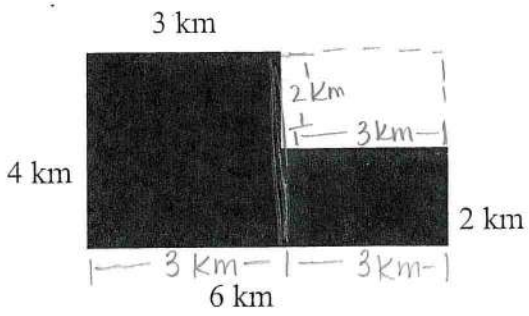
$5(9+2)-2(36-25)$

$5(11)-2(11)$

$55-22$

$\boxed{33}$

Example 4: Some urban planners specialize in planning entire new towns. These towns are designed for livability, with plenty of open space. The sketch below shows the dimensions for a new town called Panorama. Find Panorama's area.



By Addition:

$4(3)+3(2)$

$12+6$

$\boxed{18\ km^2}$

By Subtraction:

$4(6)-2(3)$

$24-6$

$\boxed{18\ km^2}$