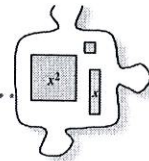### 6.2.1 How do I calculate it?

Order of Operations

An **expression (number sentence)** represents mathematical relationships using numbers, variables, and/or symbols. The rules for simplifying expressions are called the **Order of Operations (PEMDAS)**. These rules say that operations like addition and multiplication are completed in a specific order when finding the value of an expression.

Order of Operations-PEMDAS

Use the space below for a few notes about the order of operations.

6-7

P - E - MD - AS -
   Exponents   Add & subtract

Parentheses 4^2 Multiply & Divide   Left-Right
b. $(2 \cdot 7)$ $4 \cdot 4$ Left-Right $29 - 9 + 10$
14   16 $4 \cdot 3 \div 2$ $20 + 10$
                                 $12 \div 2$ 30
                                 6

6-72 Simplify the following expressions

4

a) $16 - 5(3 - 1)$

b) $3.45(2^2) - 8.18(1)$

c) $4 \cdot 5 - 22 + 3(5 - 4)$

6-73 Division: Simplify the following expressions, which include division

a) $\frac{212}{4} + 19$ b) $45.5 \div 2 + 1.8$

$212 \div 4 + 19$ $22.75 + 1.8$
$53 + 19$ $\boxed{24.55}$
$\boxed{72}$

number line: -2 -1 0 1 2

6-73 WORK:
a)
$$\begin{array}{r} 053 \\ 4\overline{)212} \\ \underline{-20\downarrow} \\ 12 \end{array}$$
$$\begin{array}{r} 53 \\ + 19 \\ \hline 72 \end{array}$$

b)
$$\begin{array}{r} 22.75 \\ 2\overline{)45.50} \\ \underline{4\downarrow} \\ 05\downarrow \\ \underline{-4\downarrow} \\ 15 \end{array}$$
$$\begin{array}{r} 22.75 \\ + 1.80 \\ \hline 24.55 \end{array}$$

25

add and ubtract L→

22

6-72

a) $16 - 5(3-1)$ ← Parentheses
$16 - 5(2)$ ← Multiply
$16 - 10$ ← Subtract
$\boxed{16}$

b) $3.45(2^2) - 8.18(1)$ ← Parentheses
$3.45(4) - 8.18(1)$ ← Multiply
$13.80 - 8.18$ ← Subtract
$\boxed{5.62}$

	300	40	5
4	1200	160	20

$\begin{array}{r} 1200 \\ + 180 \\ \hline 1380 \end{array}$

$\begin{array}{r} {}^{0}\;{}^{7} \\ 13.8\cancel{0} \\ - 8.18 \\ \hline 5.62 \end{array}$

c) $4 \cdot 5 - 22 + 3(5-4)$ ← Parentheses
$4 \cdot 5 - 22 + 3(1)$ ← Multiply
$20 - 22 + 3$ ← subtract (add and subtract L→R)
$-2 + 3$ ← Add
$\boxed{1}$

6-73 WORK:

a) $\begin{array}{r} 053 \\ 4\overline{)212} \\ 20\downarrow \\ \hline 12 \end{array}$ $\begin{array}{r} 53 \\ +19 \\ \hline 72 \end{array}$

b) $\begin{array}{r} 22.75 \\ 2\overline{)45.50} \\ 4\downarrow \\ \hline 05 \\ -4\downarrow \\ \hline 15 \end{array}$ $\begin{array}{r} 22.75 \\ +1.80 \\ \hline 24.55 \end{array}$