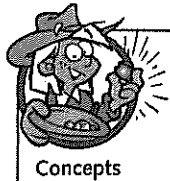


## 2:11 Order of operations



Concepts

Use this order, when operations are mixed:

- 1 Do operations inside grouping symbols.
- 2 Do  $\times$  and  $\div$  going from left to right.
- 3 Do  $+$  and  $-$  going from left to right.



$$\begin{aligned} 10 + 3 - (6 + 6) + 2 \times 2 \\ = 10 + 3 - 12 + 2 \times 2 \\ = 10 + 3 - 12 + 4 \\ = 5 \end{aligned}$$

1 a  $4 + 7 \times 3$

d  $18 - 6 \div 3$

g  $8 + 23 + 7$

j  $15 - 8 + 3$

2 a  $56 - 20 \times 2$

d  $18 \times 9 \div 9$

g  $2 \times 49 - 15$

i  $60 \div 4 + 11$

3 a  $5 \times 6 + 4 \times 5$

c  $(5 \times 6 + 4) \times 5$

e  $48 \div (4 + 4 \div 2)$

h  $50 - 5 - (5 - 5)$

b  $(4 + 7) \times 3$

e  $(18 - 6) \div 3$

h  $8 + (23 + 7)$

k  $50 \div (5 \div 5)$

b  $(56 - 20) \times 2$

e  $(18 \times 9) \div 9$

h  $2 \times (49 - 15)$

j  $60 \div (4 + 11)$

b  $5 \times (6 + 4) \times 5$

d  $48 \div 4 + 4 \div 2$

f  $48 \div (4 + 4) \div 2$

i  $15 + 30 \div (5 - 4)$

c  $10 - 6 - 4$

f  $40 \div 4 - 2$

i  $23 + 12 - 11$

l  $6 \times 7 \times 10$

c  $56 - (20 \times 2)$

f  $18 \times (9 \div 9)$



g  $50 - (5 + 5 \div 5)$

j  $(15 + 30) \div 5 - 4$

4 a  $80 - 5 - 5 - 5 - 5 - 5 - 5$

c  $48 - 6 - 6 - 6 - 6 - 6 - 6$

e  $64 \div 2 \div 2 \div 2 \div 2 \div 2 \div 2$

g  $6 \times 5 + 3 \times 8 + 6 \times 8 - 100$

b  $80 - (5 + 5 + 5 + 5 + 5 + 5)$

d  $48 - (6 + 6 + 6 + 6 + 6 + 6)$

f  $64 \div (2 \times 2 \times 2 \times 2 \times 2 \times 2)$

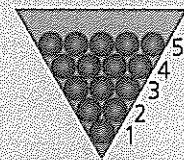
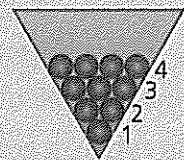
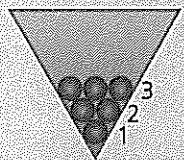
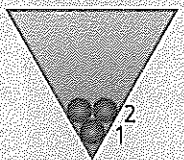
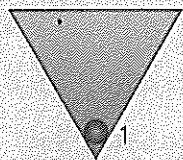
h  $40 \div 5 - 36 \div (8 + 1) - 8 \div 4$



Fun Spot

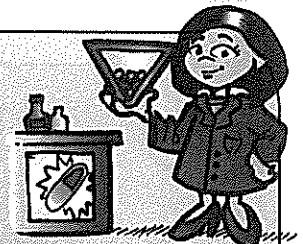
### Triangular numbers

- Chemists count pills in triangular pill trays. If the pills form a triangle, the number of pills is called a triangular number.
- How many pills are in each of these pill trays?



Each layer has one more than the layer below it.

- You have found the first five triangular numbers. Now find the next five.



## 2:12 Order of operations

This flow chart really helps.



Concepts

START  
↓  
Do operations inside grouping symbols.

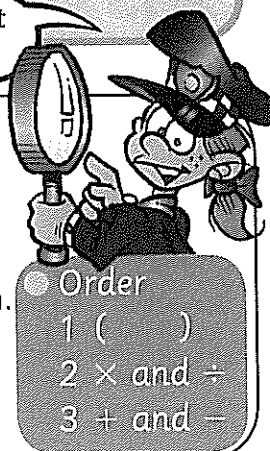
↓  
Do multiplication and division going from left to right.

↓  
Do addition and subtraction going from left to right.

STOP

### Example

$8 \times (3 + 4) - 12 \div (1 + 2)$   
Remove grouping symbols.  
 $= 8 \times 7 - 12 \div 3$   
Do multiplication and division.  
 $= 56 - 4$   
Do addition and subtraction.  
 $= 52$



- 1 a  $3 \times (5 + 5)$  b  $6 - 3 \times 2$  c  $7 + 16 \div 4$   
d  $10 - (8 - 4)$  e  $(16 - 6) \times 8$  f  $(15 + 3) \div 6$   
g  $14 - 6 \times 2$  h  $18 + 10 \div 2$  i  $50 \div 5 \times 5$   
j  $20 \div 5 - 4$  k  $16 \times 3 + 40$  l  $16 + 3 \times 40$

- 2 a  $2 \times 3 + 2 \times 10$  b  $4 + 6 \times 7 + 3$   
c  $6 \times 8 - 7 \times 4 - 4$  d  $15 \times (6 + 11 - 7)$   
e  $(6 + 3) \times 7 - 15 + 1$  f  $80 - (63 - 13) + 7$   
g  $8 - 5 + 5 - 8 + 8 + 2$  h  $16 + 4 \times 18 \div 2 - 4$   
i  $150 + (0 \div 7) \times 10 - 50$  j  $74 - 8 - 8 - (8 - 8)$   
k  $15 \div (3 \times 5) + (3 \times 5)$  l  $50 + 16 \div (8 \div 8) - (6 \times 8)$

- 3 Put in grouping symbols to make each sentence true.

- a  $16 - 3 \times 2 = 26$  b  $6 - 3 \times 2 = 6$  c  $10 \times 6 + 4 = 100$   
d  $6 \times 3 + 5 = 48$  e  $50 \div 5 + 5 = 5$  f  $70 \div 10 - 3 = 10$   
g  $27 - 14 - 8 = 21$  h  $4 + 3 \times 12 - 2 - 10 = 72$   
i  $100 \times 40 - 20 - 10 = 1000$

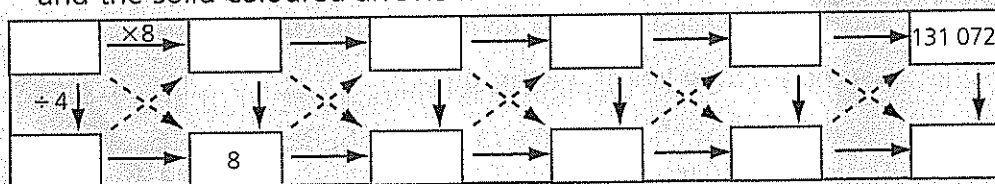
### Example

$6 + 12 \div 3 + 1 = 9$   
Guess and check  
 $(6 + 12) \div 3 + 1 = 7$  No  
 $6 + 12 \div (3 + 1) = 9$  Yes



## A bridge of numbers

- 4 a Fill in these rectangles if the solid black arrows mean  $\div 4$  and the solid coloured arrows mean  $\times 8$ .



What operation is needed to link the boxes along:

- b the black broken arrows? c the coloured broken arrows?

