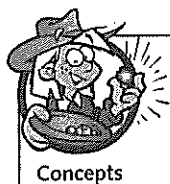


2:20 Order of operations



Do operations inside the grouping symbols first.

$$2 + (6 \times 3)$$

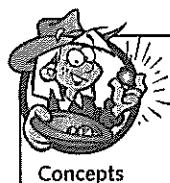
grouping symbols

We say:
 $6 \times 3 = 18$ then
 $2 + 18 = 20$.

Do (6×3) first.

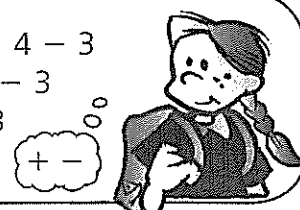


- 1 a $30 + (16 \div 4)$ b $23 - (14 + 6)$ c $4 + (5 \times 6)$
 d $8 \div (16 - 12)$ e $30 - (30 - 10)$ f $46 - (19 + 11)$
 g $(12 - 10) \times (20 - 5)$ h $(8 + 7) \div (13 - 8)$ i $6 \times (3 + 6 + 1)$

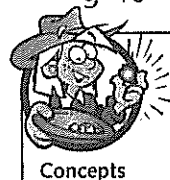


If only addition and subtraction are present, do the operations in order, going from left to right.

Example: $14 - 6 + 4 - 3$
 $= 8 + 4 - 3$
 $= 12 - 3$
 $= 9$

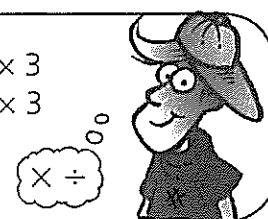


- 2 a $30 + 6 - 11$ b $21 - 12 + 8$ c $37 - 12 - 6$
 d $60 + 14 - 4$ e $16 + 10 - 9$ f $33 - 10 + 3$
 g $40 - 10 - 8 - 2$ h $42 + 8 + 9 - 7$ i $64 - 4 - 6 + 12$

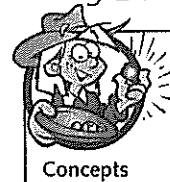


If only multiplication and division are present, do the operations in order, going from left to right.

Example: $4 \times 5 \div 10 \times 3$
 $= 20 \div 10 \times 3$
 $= 2 \times 3$
 $= 6$

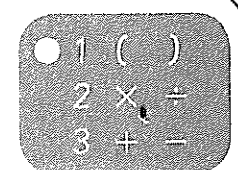


- 3 a $3 \times 4 \times 2$ b $9 \div 3 \times 5$ c $5 \times 6 \div 10$
 d $12 \div 4 \times 6$ e $14 \div 7 \times 9$ f $20 \div 5 \times 3$
 g $24 \div 6 \times 2 \div 4$ h $3 \times 8 \div 2 \div 3$ i $3 \times 2 \times 2 \div 6$



Order: 1 Grouping symbols
 2 \times and \div , left to right
 3 $+$ and $-$, left to right

Example: $15 - (12 - 2) \div 5$
 $= 15 - 10 \div 5$
 $= 15 - 2$
 $= 13$



- 4 a $3 + 7 \times 8$ b $20 - 3 \times 2$ c $9 - 18 \div 3$
 d $15 + 4 \times 5$ e $16 - (13 - 8) \times 2$ f $6 \times 8 - (3 \times 7)$
 g $6 + (8 - 3) \div 5$ h $18 + 20 \times 2 \div 5$ i $40 - 8 + 4 \times 2$

2:12 Order of operations

This flow chart really helps.



Concepts

START
Do operations inside grouping symbols.

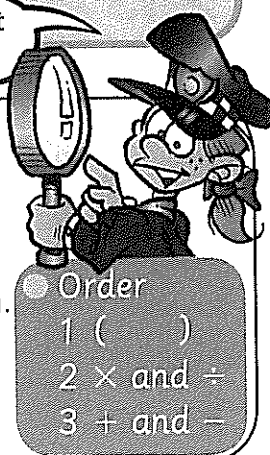
Do multiplication and division going from left to right.

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 $100 \times 40 - 20 - 10 = 1000$

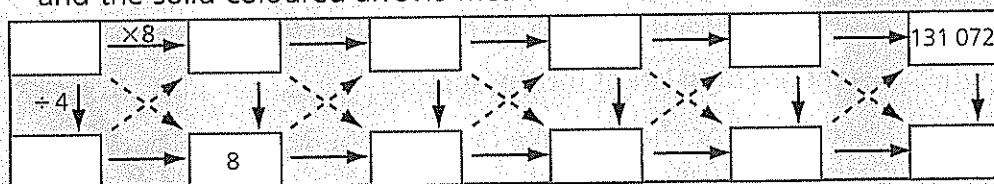
Example

$6 + 12 \div 3 + 1 = 9$
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?

