

## Order of Operations

### Starter

1. (Review of Y7 material)

Find the value of: (a)  $2 + 5 \times 6$  (b)  $25 \div (9 - 4)$  (c)  $5 \times 4^2$

**N.B.** If you've forgotten about order of operations (BIDMAS), click [here](#) or read on.

**Working:** (a) **M**ultiplication before **A**ddition:  $2 + 5 \times 6 = 2 + 30 = 32$

(b) **B**rackets before **D**ivision:  $25 \div (9 - 4) = 25 \div 5 = 5$

(c) **I**ndices before **M**ultiplication:  $5 \times 4^2 = 5 \times 16 = 80$

**E.g. 1** Find the value of the following calculations:

(a)  $3 \times (7 - 2) - 5 \times 3$

(b)  $4 \times (5 - 3)^3 - 2$

(c)  $18 - 3 \times 2^2$

(d)  $20 + 4 \times 5^2 = 120$

(e)  $2 \times 4^3 + 4$

(f)  $(8 - 3 \times 2)^3 = 8$

**Working:** (a)  $3 \times (7 - 2) - 5 \times 3 = 3 \times 5 - 5 \times 3$  **brackets first**  
 $= 15 - 15$  **multiplication before subtraction**  
 $= 0$

(b)  $4 \times (5 - 3)^3 - 2 = 4 \times 2^3 - 2$  **brackets first**  
 $= 4 \times 8 - 2$  **indices second**  
 $= 32 - 2$  **multiplication before subtraction**  
 $= 30$

(c)  $18 - 3 \times 2^2 = 18 - 3 \times 4$  **indices before multiplication**  
 $= 18 - 12$  **multiplication before subtraction**  
 $= 6$

(d)  $20 + 4 \times 5^2 = 20 + 4 \times 25$  **indices before multiplication**  
 $= 20 + 100$  **multiplication before addition**  
 $= 120$

(e)  $2 \times 4^3 + 4 = 2 \times 64 + 4$  **indices before multiplication**  
 $= 128 + 4$  **multiplication before addition**  
 $= 132$

(f)  $(8 - 3 \times 2)^3 = (8 - 6)^3$  **brackets, multiplication before subtraction**  
 $= 2^3$  **brackets before indices**  
 $= 8$

**E.g. 2** Insert brackets to the following calculation to make them correct:

(a)  $3 + 2 \times 5 = 25$

(b)  $8 + 2 \times 6 - 5 = 10$

(c)  $1 + 9 + 10 \div 4 = 5$

(d)  $8 - 2^3 + 1 = 1$

**N.B.** Inserting brackets is usually a bit of trial and error

**Working:** (a)  $(3 + 2) \times 5 = 25$

(b)  $8 + 2 \times (6 - 5) = 10$

(c)  $(1 + 9 + 10) \div 4 = 5$

(d)  $(8 - 2^3) + 1 = 1$  or “no brackets needed”.

**Video:** [Order of operations](#)

[Solutions to Starter and E.g.s](#)

### Exercise

p67 Ex 4.3 Qu 1acegi, 2aceg, 3-9 (not qu 10)

[Textbook answers \(only available during a lockdown\)](#)