

# Order of Operations (BIDMAS)

Maths

Level 2

Exam-style practice · 11 questions · 31 marks · Non-calculator

## Remember

**BIDMAS:** **B**rackets, **I**ndices (powers), **D**ivision and **M**ultiplication (left to right), **A**ddition and **S**ubtraction (left to right).

$3 + 4 \times 5 = 3 + 20 = \mathbf{23}$ , not 35.  $(3 + 4) \times 5 = \mathbf{35}$ .  $20 - 8 \div 2 = 20 - 4 = \mathbf{16}$ .

**Calculator tip:** a scientific calculator follows BIDMAS; a basic one may not. For a fraction line or 'of', use brackets:  $(12 + 18) \div (5 - 2)$ .

**Squaring:**  $3 \times 4^2 = 3 \times 16 = 48$ , because the power belongs to the 4 only.  $(3 \times 4)^2 = 144$ .

## Section A – Apply the rule

1. Work out: (a)  $6 + 3 \times 4$  (b)  $(6 + 3) \times 4$  (c)  $24 \div 4 + 2$  (d)  $24 \div (4 + 2)$  (e)  $5 \times 2^2$  (f)  $18 - 12 \div 3 + 1$  (6 marks)

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2. Insert brackets to make each statement true: (a)  $4 + 5 \times 3 = 27$  (b)  $30 - 10 \div 5 + 3 = 25$  (c)  $2 \times 3 + 4 \times 5 = 70$  (3 marks)

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3. Jade types  $100 - 20 \times 3$  into a basic calculator and gets 240. Explain what the calculator did and what the correct answer is. (2 marks)

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## Section B – In context

4. A plumber charges a £40 call-out fee plus £28 an hour. Write a calculation for a 3.5-hour job and work it out. (2 marks)

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5. Tickets cost £12 for adults and £7 for children. A group of 4 adults and 6 children pays with £100. Write one calculation for the change and work it out. (3 marks)

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6. Priya's monthly pay is worked out as: (hours  $\times$  rate) + bonus – pension. She worked 152 hours at £11.50, got a £75 bonus and pays £68 pension. What is her pay? (3 marks)

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7. The cost of a taxi is £3 plus £1.80 per mile. Which is correct for a 7-mile journey:  $3 + 1.80 \times 7$ , or  $(3 + 1.80) \times 7$ ? Work out the fare. (2 marks)

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## Section C – Formulas and calculators

8. Use the formula  $A = (a + b) \times h \div 2$  to find the area of a trapezium with  $a = 6$ ,  $b = 10$  and  $h = 4$ . (2 marks)

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9. Convert 25 °C to Fahrenheit using  $F = 9C \div 5 + 32$ . Then convert 68 °F to Celsius using  $C = (F - 32) \times 5 \div 9$ . (4 marks)

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10. Work out  $(14.5 + 9.3) \div (6.2 - 3.4)$ . Write down the calculator keys you would press, in order. (2 marks)

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11. The mean of five numbers is  $(12 + 18 + 7 + 23 + 15) \div 5$ . Sam types  $12 + 18 + 7 + 23 + 15 \div 5$  and gets 63. What did he do wrong, and what is the mean? (2 marks)

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# Order of Operations (BIDMAS) – Answers

Level 2 · Working shown so you can check your method, not just the final number.

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## Section A

1. (a) **18** (b) **36** (c) **8** (d) **4** (e) **20** (f)  $18 - 4 + 1 = \mathbf{15}$ .
2. (a)  $(4 + 5) \times 3 = 27$ . (b)  $30 - (10 \div 5 + 3) = 30 - 5 = 25$ . (c)  $2 \times (3 + 4) \times 5 = 70$ .
3. A basic calculator works left to right:  $100 - 20 = 80$ , then  $\times 3 = 240$ . Correct:  $100 - 60 = \mathbf{40}$ .

## Section B

4.  $40 + 28 \times 3.5 = 40 + 98 = \mathbf{£138}$ .
5.  $100 - (4 \times 12 + 6 \times 7) = 100 - (48 + 42) = \mathbf{£10}$ .
6.  $(152 \times 11.50) + 75 - 68 = 1,748 + 75 - 68 = \mathbf{£1,755}$ .
7.  $\mathbf{3 + 1.80 \times 7}$  (the £3 is paid once).  $3 + 12.60 = \mathbf{£15.60}$ .

## Section C

8.  $(6 + 10) \times 4 \div 2 = 16 \times 4 \div 2 = \mathbf{32}$ .
9.  $9 \times 25 \div 5 + 32 = 45 + 32 = \mathbf{77^\circ F}$ .  $(68 - 32) \times 5 \div 9 = 36 \times 5 \div 9 = \mathbf{20^\circ C}$ .
10.  $23.8 \div 2.8 = \mathbf{8.5}$ . Keys:  $( 14.5 + 9.3 ) \div ( 6.2 - 3.4 ) =$
11. He divided only the 15 by 5. He needed brackets:  $(12 + 18 + 7 + 23 + 15) \div 5 = 75 \div 5 = \mathbf{15}$ .

## Where Level 2 students lose marks on order of operations (bidmas)

- Reading left to right on a calculator:  $100 - 20 \times 3$  becomes 240. Use a scientific calculator, or work out the multiplication first.
- Forgetting brackets around the top and bottom of a fraction, or around a total before dividing for a mean.
- Multiplying a fixed charge by the number of hours: a £40 call-out fee is paid once, so it is  $40 + 28 \times 3.5$ , not  $(40 + 28) \times 3.5$ .