

GCSE Maths: Order of operations (BIDMAS) (Higher): answers

GCSE Maths - Number Basics - Higher - Lesson 1.6

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch01-number-basics/higher/order-of-operations-bidmas/

Exercise 1F Order of operations Non-calculator

1 Work out each calculation. Show each step.

(a) $2 + 3 \times 4$

Answer: 14

(b) $20 - 12 \div 4$

Answer: 17

(c) $3 \times 5 + 2 \times 6$

Answer: 27

(d) $18 \div 3 + 4 \times 2$

Answer: 14

(e) $7 + 8 \div 2 - 1$

Answer: 10

(f) $5 \times 4 - 3 \times 2$

Answer: 14

2 Work out each calculation. Brackets change the order.

(a) $(2 + 3) \times 4$

Answer: 20

(b) $3 \times (8 - 5)$

Answer: 9

(c) $(12 + 8) \div (7 - 3)$

Answer: 5

(d) $36 \div (2 + 4) \times 3$

Answer: 18

(e) $2 \times (3 + 4) \times 5$

Answer: 70

3 Work out each calculation with powers and roots.

(a) $3^2 + 4^2$

Answer: 25

(b) $5^2 - \sqrt{49}$

Answer: 18

(c) $2^3 \times 3$

Answer: 24

(d) $\sqrt{36} + 2^3$

Answer: 14

(e) $\sqrt[3]{27} \times 2^2$

Answer: 12

4 Work out each calculation.

(a) $(3 + 2)^2 - 4 \times 3$

Answer: 13

(b) $150 - 3 \times (4 + 2)^2$

Answer: 42

(c) $\frac{12 + 6}{5 - 2} + \sqrt{49} \times 2$

Answer: 20

5 Three tickets cost £8 each and two snacks cost £3.50 each. Write down a calculation for the total cost and work it out.

Answer: £31

6 Faith wants to add 5 and 7 and then multiply the result by 3.

(a) Write the calculation, using brackets, and work it out.

Answer: 36

(b) What does $5 + 7 \times 3$ give? Why is it different?

Answer: 26

7 Sam writes $6 + 2 \times 5 = 40$. Explain his mistake and work out the correct answer.

Answer: 16

8 Show that the fraction line matters.

(a) $\frac{20 - 8}{2 + 4} = 2$

Answer: 2

(b) $20 - 8 \div 2 + 4 = 20$

Answer: 20

9 Put brackets in the calculation $4 + 3 \times 2 = 14$ to make it correct.

Answer: $(4 + 3) \times 2$

10 Work out each of these. Take care with the negative signs.

(a) -3^2

Answer: -9

(b) $(-3)^2$

Answer: 9

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

Answer: 18

(d) $(-2)^3 + 10$

Answer: 2

11 Work out the value of $5 + 3a^2$ when $a = -2$.

Answer: 17

12 Put one pair of brackets in $3 + 4 \times 5 - 2 = 33$ to make it correct.

Answer: $(3 + 4) \times 5 - 2$

13 Use each of the numbers 1, 2, 3 and 4 once, with the symbols $+$, $-$ and $\times$ (and brackets if you want), to make 10. Find two different ways.

Answer: $1 + 2 + 3 + 4 = 10$ and $4 \times 3 - 2 \times 1 = 10$

Exercise 1G Using a calculator with BIDMAS

Calculator allowed

1 Use a calculator to work out each calculation. Write down all the figures on your calculator display.

(a) $12.5 + 3.4 \times 2.5$

Answer: 21

(b) $(12.5 + 3.4) \times 2.5$

Answer: 39.75

(c) $18.6 - (4.2)^2$

Answer: 0.96

(d) $(3.5)^2 + 2.4 \times 1.5$

Answer: 15.85

(e) $\sqrt{6.4 + 2.6}$

Answer: 3

(f) $2^3 \times 1.25 - (0.5)^2$

Answer: 9.75

2 Work out each of these. Remember that the fraction line acts like brackets.

(a) $\frac{7.2 + 4.8}{3.5 - 1.5}$

Answer: 6

(b) $\frac{15.6 - 3.6}{0.8 \times 1.5}$

Answer: 10

(c) $\frac{3^2 + 4^2}{5}$

Answer: 5

- 3 A taxi firm charges £3.20 plus £1.45 for each mile. Work out the cost of a journey of 12 miles.

Answer: £20.60

- 4 A gym charges a joining fee of £30 and £9.50 each week. Work out the cost of 52 weeks.

Answer: £524

- 5 A mobile phone company has two plans. Plan A costs £15 a month plus 8p per minute of calls. Plan B costs £5 a month plus 12p per minute. Jun uses 300 minutes of calls in a month.

- (a) Work out the cost of Plan A.

Answer: £39

- (b) Work out the cost of Plan B.

Answer: £41

- (c) Which plan is cheaper for Jun, and by how much?

Answer: Plan A, by £2

- 6 Hana types $12 + 6 \div 5 - 2$ into her calculator to work out $\frac{12 + 6}{5 - 2}$. She gets 11.2. Explain her mistake and show how she should do it.

Answer: 6

- 7 Work out each calculation.

(a) $\sqrt{5^2 + 12^2}$

Answer: 13

(b) $3.5 \times (2.4 - 0.9)^2$

Answer: 7.875

(c) $(2.5 + 1.5)^3 \div 8$

Answer: 8

- 8 Work out each value.

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

Answer: 50

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

Answer: 80

9 Show that $\sqrt{9 + 16}$ is **not** equal to $\sqrt{9} + \sqrt{16}$.

(a) Work out $\sqrt{9 + 16}$.

Answer: 5

(b) Work out $\sqrt{9} + \sqrt{16}$.

Answer: 7

10 A rectangle has length $l = 12.5$ cm and width $w = 8.75$ cm. Use a calculator.

(a) Work out the perimeter using $P = 2(l + w)$.

Answer: 42.5

(b)

A trapezium has parallel sides 7.5 cm and 4.5 cm and height 6 cm. Work out its area using $A = 0.5(a + b)h$.

Answer: 36