

Negative Numbers and Order of Operations

GCSE Mathematics • Foundation Tier • Grades 1–3 • Non-calculator

WORKED SOLUTIONS

Name: worked example

Class:

Total: 38 / 38

Show all your working. Marks are given for correct method as well as the final answer.

1. Work out $-6 + 10$. [1 mark]

start at -6, move 10 right

Answer: 4

2. Work out $4 - 9$. [1 mark]

start at 4, move 9 left

Answer: -5

3. Work out $-3 - 8$. [1 mark]

*both going down
-3 then 8 more left*

Answer: -11

4. Work out $5 - (-4)$. [2 marks]

*two minuses together = plus
5 + 4
-(-) becomes +*

Answer: 9

5. Work out $-7 + (-2)$. [2 marks]

*+(-) becomes -
-7 - 2*

Answer: -9

6. Work out -4×6 . [1 mark]

minus $\times$ plus = minus

Answer: -24

7. Work out $-5 \times (-3)$. [2 marks]

*minus $\times$ minus = plus
same signs $\rightarrow$ positive*

Answer: 15

8. Work out $-20 \div 4$. [1 mark]

minus $\div$ plus = minus

Answer: -5

9. Work out $(-3)^2$. [2 marks]

*-3 $\times$ -3
same signs $\rightarrow$ +
the bracket squares the minus too*

Answer: _____ 9 _____

10. Work out -3^2 . [2 marks]

no bracket, so only the 3 is squared
 $-(3 \times 3) = -9$
compare with the last question!

Answer: _____ -9 _____

11. Work out $4 + 3 \times 5$. [2 marks]

multiply first: $3 \times 5 = 15$
 $4 + 15 = 19$
NOT 35

Answer: _____ 19 _____

12. Work out $(4 + 3) \times 5$. [2 marks]

bracket first: $4 + 3 = 7$
 $7 \times 5 = 35$

Answer: _____ 35 _____

13. Work out $20 - 6 \div 2$. [2 marks]

divide first: $6 \div 2 = 3$
 $20 - 3 = 17$

Answer: _____ 17 _____

14. Work out $2 + 3^2 \times 2$. [2 marks]

indices: $3^2 = 9$
 $9 \times 2 = 18$
 $2 + 18 = 20$

Answer: _____ 20 _____

15. Work out $5 \times (8 - 2)^2$. [3 marks]

bracket: $8 - 2 = 6$
index: $6^2 = 36$
 $36 \times 5 = 180$

Answer: _____ 180 _____

16. Work out $\frac{12 + 8}{5 - 1}$. [2 marks]

the line acts as a bracket
top: 20 bottom: 4
 $20 \div 4 = 5$

Answer: _____ 5 _____

17. Work out $6 + 2 \times (-4)$. [2 marks]

$2 \times -4 = -8$
 $6 - 8 = -2$

Answer: _____ -2 _____

18. At midnight the temperature was -6°C . By noon it had risen by 11°C . Work out the temperature at noon. [2 marks]

$$\begin{aligned} -6 + 11 \\ = 5^{\circ}\text{C} \end{aligned}$$

Answer: _____ 5°C _____

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19. Priya's bank balance is \$35. She pays a bill of \$52. Work out her new balance. [2 marks]

$$\begin{aligned} 35 - 52 \\ = -17 \\ \text{overdrawn by } \pounds 17 \end{aligned}$$

Answer: _____ $-\pounds 17$ _____

20. The temperatures in four cities were -3 , 5 , -8 and 0°C .

- (a) Write them in order, coldest first. [2 marks]

$$\begin{aligned} -8 \quad -3 \quad 0 \quad 5 \\ -8 \text{ is colder than } -3 \end{aligned}$$

- (b) Work out the difference between the highest and lowest. [2 marks]

$$\begin{aligned} \text{highest } 5, \text{ lowest } -8 \\ 5 - (-8) = 5 + 8 \\ = 13^{\circ}\text{C} \end{aligned}$$

Answer: _____ $-8, -3, 0, 5; 13^{\circ}\text{C}$ _____