

# Maths Mastery

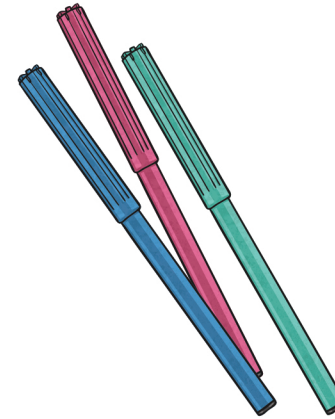
## Order of Operations

### Challenge Cards



#### Maths Mastery - Order of Operations

1. Put brackets into these number sentences so they are true:



$$15 + 7 \times 4 = 88$$

$$18 - 9 - 2 = 11$$

$$8 \times 4 - 2 \times 5 = 22$$

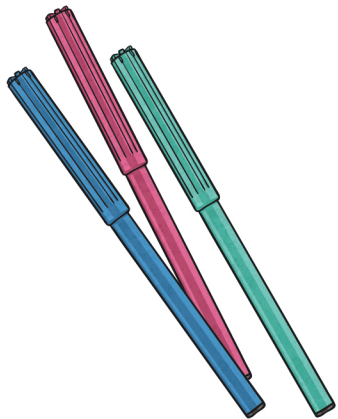
$$16 \div 8 - 4 = 4$$

$$9 + 12 \div 7 - 4 = 7$$

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#### Maths Mastery - Order of Operations

2. Complete these number sentences by putting in operations.



$$5 \square 4 \square 6 = 7$$

$$5 \square 4 \square 6 = 3$$

$$5 \square 4 \square 6 = 29$$

$$5 \square 4 \square 6 = 15$$

$$5 \square 4 \square 6 = 26$$

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#### Maths Mastery - Order of Operations

3. How many different ways can you write a number sentence using the numbers 2, 3, 4 and 5, where the answer is 10? Use any operation, but each number can only be used once in any number sentence.

What about using a 6 as well?

Or try 4 other numbers and a different total.



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4. How many different answers can you make using the numbers 3, 4 and 5 to create different number sentences?

- a. Using 1 operation.
- b. Using two operations but no brackets.
- c. Using two operations with brackets, with answers not found with using no brackets.



# Order of Operations – Answers

1.  $(15 + 7) \times 4 = 88$

$18 - (9 - 2) = 11$

$8 \times 4 - 2 \times 5 = 22$  - no brackets

$16 \div (8 - 4) = 4$

$(9 + 12) \div (7 - 4) = 7$

2.  $5 - 4 + 6 = 7$

$5 + 4 - 6 = 3$

$5 + 4 \times 6 = 29$

$5 + 4 + 6 = 15$

$5 \times 4 + 6 = 26$

3.  $2 \times 5$

$3 \times 4 - 2$

$4 \times 5 \div 2$

$(4 - 2) \times 5$

$2 + 3 + 5$

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

other answers possible

4. one operation:

$3 + 4 = 7$

$3 + 5 = 8$

$4 + 5 = 9$

$5 - 3 = 2$

$5 - 4 = 1$

$4 - 3 = 1$

$3 - 5 = -2$

$4 - 5 = -1$

$3 - 4 = -1$

$3 \times 4 = 12$

$3 \times 5 = 15$

$4 \times 5 = 20$

$5 \div 3 = 1\frac{2}{3}$

$5 \div 4 = 1\frac{1}{4}$

$4 \div 3 = 1\frac{1}{3}$

$3 \div 5 = \frac{3}{5}$

$4 \div 5 = \frac{4}{5}$

$3 \div 4 = \frac{3}{4}$

Using 2 operations but no brackets:

There are 6 ways the numbers can be organised: 3 4 5, 3 5 4, 4 5 3, 4 3 5, 5 4 3, 5 3 4.

There are 16 ways the operations can be ordered: ++, +-, +x, +÷, etc.

You will find that sometimes you get the same answer. Sometimes, the number sentences will produce the same answer.

$3 + 4 + 5 = 12$

$3 + 4 - 5 = 2$

$3 + 4 \times 5 = 23$

$3 + 4 \div 5 = 3\frac{4}{5}$

$3 - 4 + 5 = -6$

$3 - 4 - 5 = -6$

$3 - 4 \times 5 = -17$

$3 - 4 \div 5 = 2\frac{1}{5}$

$3 \times 4 + 5 = 17$

$3 \times 4 - 5 = 7$

$3 \times 4 \times 5 = 60$

$3 \times 4 \div 5 = 2\frac{2}{5}$

$3 \div 4 + 5 = 5\frac{3}{4}$

$3 \div 4 - 5 = -4\frac{1}{4}$

$3 \div 4 \times 5 = 3\frac{3}{4}$

$3 \div 4 \div 5 = \frac{3}{20}$

$4 + 3 + 5 = 12$

$4 + 3 - 5 = 2$

$4 + 3 \times 5 = 19$

$4 + 3 \div 5 = 4\frac{3}{5}$

$4 - 3 + 5 = -4$

$4 - 3 - 5 = -2$

$4 - 3 \times 5 = -11$

$4 - 3 \div 5 = 3\frac{2}{5}$

$4 \times 3 + 5 = 17$

$4 \times 3 - 5 = 7$

$4 \times 3 \times 5 = 60$

$4 \times 3 \div 5 = 2\frac{2}{5}$

$4 \div 3 + 5 = 6\frac{1}{3}$

$4 \div 3 - 5 = -3\frac{2}{3}$

$4 \div 3 \times 5 = 6\frac{2}{3}$

$4 \div 3 \div 5 = \frac{4}{15}$

$5 + 4 + 3 = 12$

$5 + 4 - 3 = 6$

$5 + 4 \times 3 = 17$

$5 + 4 \div 3 = 6\frac{1}{3}$

$5 - 4 + 3 = -2$

$5 - 4 - 3 = -2$

$5 - 4 \times 3 = -7$

$5 - 4 \div 3 = 3\frac{2}{3}$

$5 \times 4 + 3 = 23$

$5 \times 4 - 3 = 17$

$5 \times 4 \times 3 = 60$

$5 \times 4 \div 3 = 6\frac{2}{3}$

$5 \div 4 + 3 = 4\frac{1}{4}$

$5 \div 4 - 3 = -1\frac{3}{4}$

$5 \div 4 \times 3 = 3\frac{3}{4}$

$5 \div 4 \div 3 = \frac{5}{12}$

$3 + 5 + 4 = 12$

$3 + 5 - 4 = 4$

$3 + 5 \times 4 = 23$

$3 + 5 \div 4 = 4\frac{1}{4}$

$3 - 5 + 4 = 2$

$3 - 5 - 4 = -6$

$3 - 5 \times 4 = -17$

$3 - 5 \div 4 = 1\frac{3}{4}$

$3 \times 5 + 4 = 19$

$3 \times 5 - 4 = 11$

$3 \times 5 \times 4 = 60$

$3 \times 5 \div 4 = 3\frac{3}{4}$

$3 \div 5 + 4 = 4\frac{3}{5}$

$3 \div 5 - 4 = -3\frac{2}{5}$

$3 \div 5 \times 4 = 2\frac{2}{5}$

$3 \div 5 \div 4 = \frac{3}{20}$

$4 + 5 + 3 = 12$

$4 + 5 - 3 = 6$

$4 + 5 \times 3 = 19$

$4 + 5 \div 3 = 5\frac{2}{3}$

$4 - 5 + 3 = -4$

$4 - 5 - 3 = -4$

$4 - 5 \times 3 = -11$

$4 - 5 \div 3 = 2\frac{1}{3}$

$4 \times 5 + 3 = 23$

$4 \times 5 - 3 = 17$

$4 \times 5 \times 3 = 60$

$4 \times 5 \div 3 = 6\frac{2}{3}$

$4 \div 5 + 3 = 3\frac{4}{5}$

$4 \div 5 - 3 = -2\frac{1}{5}$

$4 \div 5 \times 3 = 2\frac{2}{5}$

$4 \div 5 \div 3 = \frac{4}{15}$

$5 + 3 + 4 = 12$

$5 + 3 - 4 = 4$

$5 + 3 \times 4 = 17$

$5 + 3 \div 4 = 5\frac{3}{4}$

$5 - 3 + 4 = -2$

$5 - 3 - 4 = -2$

$5 - 3 \times 4 = -7$

$5 - 3 \div 4 = 4\frac{1}{4}$

$5 \times 3 + 4 = 19$

$5 \times 3 - 4 = 11$

$5 \times 3 \times 4 = 60$

$5 \times 3 \div 4 = 3\frac{3}{4}$

$5 \div 3 + 4 = 5\frac{2}{3}$

$5 \div 3 - 4 = -2\frac{1}{3}$

$5 \div 3 \times 4 = 6\frac{2}{3}$

$5 \div 3 \div 4 = \frac{5}{12}$

# Order of Operations – Answers Continued

Using 2 operations with brackets:

$(3 + 4) \times 5 = 35$	$4 - (5 + 3) = -4$
$(3 + 4) \div 5 = 1\frac{2}{5}$	$4 - (5 - 3) = 2$
$3 - (4 + 5) = -6$	$(4 - 5) \times 3 = -3$
$3 - (4 - 5) = 4$	$(4 - 5) \div 3 = -\frac{1}{3}$
$(3 - 4) \times 5 = -5$	$4 \times (5 + 3) = 32$
$(3 - 4) \div 5 = -\frac{1}{5}$	$4 \times (5 - 3) = 8$
$3 \times (4 + 5) = 27$	$4 \div (5 + 3) = \frac{1}{2}$
$3 \times (4 - 5) = -3$	$4 \div (5 - 3) = 2$
$3 \div (4 + 5) = \frac{1}{3}$	$(5 + 3) \times 4 = 32$
$3 \div (4 - 5) = -3$	$(5 + 3) \div 4 = 2$
$(4 + 3) \times 5 = 35$	$5 - (3 + 4) = -2$
$(4 + 3) \div 5 = 1\frac{2}{5}$	$5 - (3 - 4) = 6$
$4 - (3 + 5) = -4$	$(5 - 3) \times 4 = 8$
$4 - (3 - 5) = 6$	$(5 - 3) \div 4 = \frac{1}{2}$
$(4 - 3) \times 5 = 5$	$5 \times (3 + 4) = 35$
$(4 - 3) \div 5 = \frac{1}{5}$	$5 \times (3 - 4) = -5$
$4 \times (3 + 5) = 32$	$5 \div (3 + 4) = \frac{5}{7}$
$4 \times (3 - 5) = 7$	$5 \div (3 - 4) = -5$
$4 \div (3 + 5) = \frac{1}{2}$	
$4 \div (3 - 5) = -2$	
$(5 + 4) \times 3 = 27$	
$(5 + 4) \div 3 = 3$	
$5 - (4 + 3) = -2$	
$5 - (4 - 3) = 4$	
$(5 - 4) \times 3 = 3$	
$(5 - 4) \div 3 = \frac{1}{3}$	
$5 \times (4 + 3) = 35$	
$5 \times (4 - 3) = 5$	
$5 \div (4 + 3) = \frac{5}{7}$	
$5 \div (4 - 3) = 5$	
$(3 + 5) \times 4 = 32$	
$(3 + 5) \div 4 = 2$	
$3 - (5 + 4) = -6$	
$3 - (5 - 4) = 2$	
$(3 - 5) \times 4 = -8$	
$(3 - 5) \div 4 = -\frac{1}{2}$	
$3 \times (5 + 4) = 27$	
$3 \times (5 - 4) = 3$	
$3 \div (5 + 4) = \frac{1}{3}$	
$3 \div (5 - 4) = 3$	
$(4 + 5) \times 3 = 27$	
$(4 + 5) \div 3 = 3$	