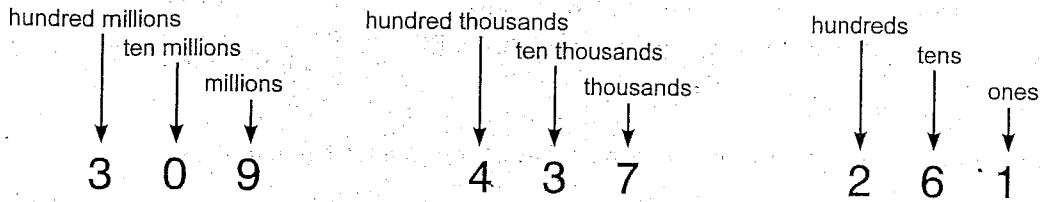


NS7-1 Place Value

The place values in 309 437 261 are:



1. Write the next three place values greater than hundred millions, from largest to smallest.

_____ *billions* _____

2. Underline the digit with the given place value.

- | | |
|--|---|
| a) 250 329 120 ten millions | b) 791 250 329 120 ten billions |
| c) 791 250 329 120 hundred millions | d) 791 250 329 120 thousands |
| e) 791 250 329 120 billions | f) 791 250 329 120 hundred thousands |

3. Write the place value of the bold digit.

- | | |
|--|---------------------------------------|
| a) 861 359 746 323 <u>ten billions</u> | b) 861 359 746 323 <u>millions</u> |
| c) 861 3 59 746 323 _____ | d) 8 61 359 746 323 _____ |
| e) 861 3 59 746 323 _____ | f) 8 61 359 746 323 _____ |

4. Write the number with the correct spacing, then write the place value of the digit 5.

- | | |
|---|------------------------------|
| a) 1405897660213 = <u>1</u> <u>405</u> <u>897</u> <u>660</u> <u>213</u> | place value: <u>billions</u> |
| b) 76312098532 = _____ | place value: _____ |
| c) 995132498763 = _____ | place value: _____ |
| d) 3542706 = _____ | place value: _____ |
| e) 5410328 = _____ | place value: _____ |
| f) 841073521960347 = _____ | place value: _____ |

5. Write each number in expanded form. Example: 74 512 = 70 000 + 4 000 + 500 + 10 + 2

- a) 378 403 _____
- b) 16 025 _____
- c) 721 803 _____

6. Write the number for each expanded form. Example: 50 000 + 600 + 40 = 50 640

- a) 30 000 + 4 000 + 50 + 3 b) 600 000 + 30 c) 40 000 + 200 + 5

NS7-2 Order of Operations

We add and subtract the way we read: from left to right.

1. Add or subtract from left to right.

a) $7 + 3 - 2$
 $= 10 - 2$
 $= 8$

b) $7 - 3 + 2$

c) $8 + 4 + 2$

d) $6 + 4 - 5$

2. a) Do the addition in brackets first.

i) $(4 + 6) + 5$
 $= \underline{\quad} + 5$
 $= \underline{\quad}$

ii) $4 + (6 + 5)$
 $= 4 + \underline{\quad}$
 $= \underline{\quad}$

b) Does the answer change depending on which addition you did first?

3. a) Do the subtraction in brackets first.

i) $(7 - 4) - 2$
 $= \underline{\quad} - \underline{\quad}$
 $= \underline{\quad}$

ii) $7 - (4 - 2)$
 $= \underline{\quad} - \underline{\quad}$
 $= \underline{\quad}$

b) Does the answer change depending on which subtraction you did first?

If there are brackets in an equation, do the operations in brackets first.

Example: $7 - 3 + 2 = 4 + 2 = 6$ but $7 - (3 + 2) = 7 - 5 = 2$

4. a) Calculate each expression using the correct order of operations.

i) $(15 + 7) - 3 - 1$

ii) $15 + (7 - 3) - 1$

iii) $15 + 7 - (3 - 1)$

iv) $(15 + 7 - 3) - 1$

v) $15 + (7 - 3 - 1)$

vi) $(15 + 7) - (3 - 1)$

b) How many different answers did you get in part a)? _____

5. a) Add brackets in different ways to get as many different answers as you can.

i) $15 + 7 + 3 + 1$

ii) $15 - 7 + 3 - 1$

iii) $15 + 7 - 3 + 1$

iv) $15 - 7 - 3 - 1$

b) How many different answers did you get in part a)? i) _____ ii) _____ iii) _____ iv) _____

c) Check all that apply. The order of operations affects the answer when the expression consists of...

addition only

subtraction only

addition and subtraction

Multiplication and division are also done from left to right. If there are brackets, do the operations in brackets first. Example: $15 \div 5 \times 3 = 3 \times 3 = 9$ but $15 \div (5 \times 3) = 15 \div 15 = 1$

6. Evaluate each expression.

a) $4 \times 3 \div 6 \times 7$ b) $6 \times 4 \div 2 \div 3$ c) $30 \div 5 \div (2 \times 3)$ d) $16 \times 2 \div (4 \times 2)$

7. a) Add brackets in different ways to get as many different answers as you can.

i) $2 \times 3 \times 2 \times 5$ ii) $64 \div 8 \div 4 \div 2$ iii) $90 \div 5 \times 6 \div 3$

b) Which expression in part a) gives the same answer, no matter where you place the brackets?

8. Do the operation in brackets first.

a) $10 + (4 \times 2)$ b) $(10 + 4) \times 2$ c) $(10 + 4) \div 2$ d) $10 + (4 \div 2)$
 $= 10 + 8$

$= 18$

e) $10 - (4 \times 2)$ f) $(10 - 4) \times 2$ g) $(10 - 4) \div 2$ h) $10 - (4 \div 2)$

9. Check all that apply. The order of operations affects the answer when the expression combines...

addition and multiplication

addition and division

subtraction and multiplication

subtraction and division

addition and subtraction

multiplication and division

Mathematicians have ordered the operations to avoid writing brackets all the time. The order is:

1. Operations in brackets.
2. Multiplication and division, from left to right.
3. Addition and subtraction, from left to right.

Example: $3 \times 5 + 3 \times 6 = (3 \times 5) + (3 \times 6)$ but $3 \times (5 + 3) \times 6$
 $= 15 + 18$ $= 3 \times 8 \times 6$
 $= 33$ $= 24 \times 6$
 $= 144$

10. Evaluate each expression. Use the correct order of operations.

a) $4 \times 2 - 7$ b) $2 + 4 \div 2$ c) $6 - 2 \times 3$ d) $20 \div 2 + 8$
e) $4 + 3 \times 6 - 5$ f) $6 + 6 \div 3 - 7$ g) $4 \times 3 \div 6 + 5$ h) $3 \times 7 - 6 \div 2$
i) $4 \div (2 - 1)$ j) $(5 - 1) \times 3$ k) $20 - (14 - 7)$ l) $(12 - 4) \div 4$