

Y7H U4 Order of Operations. Knowledge Organiser

Addition and subtraction have equal priority
Multiplication and division have equal priority
Brackets change the order of priority

Brackets have the highest priority
Multiplication and division have a higher priority than addition and subtraction

Complete calculations involving all four operations and brackets

Work out the following calculations

$$\begin{aligned} \text{a) } 7 + 6 \times 3 &= 7 + 18 \\ &= 25 \end{aligned}$$

$$\begin{aligned} \text{b) } 22 - 12 \div 4 &= 22 - 3 \\ &= 19 \end{aligned}$$

$$\begin{aligned} \text{c) } (8 + 3) \times 9 \div 3 &= 11 \times 9 \div 3 \\ &= 99 \div 3 \\ &= 33 \end{aligned}$$

$$\begin{aligned} \text{d) } (40 - 15) \div (15 \div 3) &= 25 \div 5 \\ &= 5 \end{aligned}$$

Complete calculations that involve brackets and vincula

Work out the following calculations

$$\begin{aligned} \text{a) } \frac{5+7 \times 4}{16-5} &= \frac{33}{11} \\ &= 3 \end{aligned}$$

$$\begin{aligned} \text{b) } \frac{4 \times 12 \div 6}{14 - 6 \times 2} &= \frac{8}{2} \\ &= 4 \end{aligned}$$

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Manipulate calculations by using brackets

Add brackets to make the following calculation correct

a) $18 - 3 + 4 \times 2 = 22$

$$(18 - (3 + 4)) \times 2 = 22$$

b) $18 - 3 + 4 \times 2 = 7$

$$18 - (3 + 4 \times 2) = 7$$

c) $3 \times 16 \div 4 \div 2 + 1 = 16$

$$3 \times 16 \div (4 \div 2 + 1) = 16$$

Construct function machines for algebraic calculations

Write a function machine for the following think of a number statements

a) Think of a number.

Multiply by 3.

$$x \longrightarrow \times 3 \longrightarrow - 2 \longrightarrow \div 2$$

Subtract 2.

Divide by 2.

$$\frac{x \times 3 - 2}{2}$$

b) Think of a number.

Subtract 9.

Divide by 2.

Add 5.

$$x \longrightarrow - 9 \longrightarrow \div 2 \longrightarrow + 5$$

$$\frac{x - 9}{2} + 5$$

For each of the 'think of a number' statements above, write an equivalent written calculation. Use a letter to represent the variable in each.

Hegarty

Order of operations

Clips 24 & 150

Function machines & algebra

Clips 158 & 159

Use order of priority to simplify algebraic expressions

a) work out the value of $22 - 2x$ if x is 7

$$22 - 2 \times 7 = 8$$

b) work out the value of $6(x + 9)$ if x is 6

$$6(6 + 9) = 90$$

c) work out the value of $\frac{5(3x-8)}{5}$ if x is 3

$$\frac{5(3 \times 3 - 8)}{5} = 1$$