Equations Warm-up: Doing calculations in the right order

Learning objectives:

3.A.2. To carry out calculations with numbers and symbols using the correct order of operations (Brackets, Exponents, Division/Multiplication, Addition/Subtraction)

The order of arithmetic operations is abbreviated as BEDMAS:
Brackets take precedence over
Exponents (or powers). Then...
Division and
Multiplication must be done before...
Addition and
Subtraction

QUESTIONS
Try the next series of questions. If you get them right just keep whizzing through them. If you get one wrong you will be able to see some feedback on what to do.

Don't use your calculator, the point of this is to get you so you can do these types of questions really easily – without even thinking.

Answers are at the end.

Q1. $5 \times 3 + 2$

Q2. 2×3^2

Q3. $20 - 3^2$

Q4. $(2+3)^2 - 5$

Q5. $\dfrac{(2+3)^2}{5} - 5$

Q6. $5a + 3b \times 2a - 4a - 3a \times 2b$

Q7. $(3a)^2 - (2a)^2 + (-4a)^2$

Q8. $(2b)^{-1} - 3b^{-1}$

Q9. $(2a)^{-2} + 3(a)^{-2}$

Q10. $(-3b)^{-3} - 3b^{-3}$

3A2: Doing calculations in the right order

ANSWERS:

A1.
5 x 3 + 2 (do **M**ultiplication)
= 15 + 2 (then **A**ddition)
= 17

A2.
2×3^2
= 2 x 9 (do the **E**xponent)
= 18 (then **M**ultiplication)

A3.
$20 - 3^2$
= 20 – 9 (do **E**xponent)
= 11 (then **S**ubtraction)

A4.
$(2+3)^2 - 5$
5^2 – 5 (do the **B**rackets)
= 20 (then **S**ubtraction)

A5.
$$\frac{(2+3)^2}{5} - 5$$
$$= \frac{5^2}{5} - 5$$ (do the **B**rackets)

$$= \frac{25}{5} - 5$$ (then then **E**xponent)
= 5 – 5 (then the **D**ivision)
= 0 (then the **S**ubtraction)

A6.
5a + 3b x 2a – 4a - 3a x 2b
= 5a + 6ab – 4a - 6ab (do the **M**ultiplication)
= a (then do the **A**ddition/**S**ubtraction)

A7.
$(3a)^2 - (2a)^2 + (-4a)^2$
$= 9a^2 - 4a^2 + 16a^2$ (do the **B**rackets)
$= 21a^2$ (then do the **A**ddition/**S**ubtraction)

3A2: Doing calculations in the right order

A8.

$(2b)^{-1} - 3b^{-1}$

$= \frac{1}{2b} - \frac{3}{b}$ (do the **B**rackets – but remember that $10^{-3} = \frac{1}{10^3}$)

$= \frac{1-6}{2b}$ (then the **S**ubtraction)

$= \frac{-5}{2b}$

A9.

$(2a)^{-2} + 3(a)^{-2}$

$= \frac{1}{4a^2} + \frac{3}{a^2}$ (do the **B**rackets)

$= \frac{1+12}{4a^2}$ (then the Addition)

$= \frac{13}{4a^2}$

A10.

$(-3b)^{-3} - 3b^{-3}$

$= \frac{-1}{27b^3} - \frac{3}{b^3}$ (do the **B**rackets)

$= \frac{-1-81}{27b^3}$ (then the **S**ubtraction)

$= \frac{-82}{27b^3}$