Integers – Lesson 9

We will start today's lesson on integers with some quick revision of multiplication and division then we will attempt some substitution questions which include division. Finally, we will start to work with equations which include some negative numbers.

First try these examples: -

1) -9×-3	**2)** 9×-3	**3)** -9×3	**4)** $-9 \div 3$
5) $-9 \div -3$	**6)** $9 \div -3$	**7)** 30×-3	**8)** $30 \div -3$
9) -30×-3	**10)** $-30 \div -3$	**11)** -30×3	**12)** $-30 \div 3$

We have already done some work on substitution. Today we will be looking at examples where we use a line to indicate division.

If $a = -3$ and $b = 4$,

$$\frac{a^2+3}{2a+b} = \frac{(-3)^2+3}{2\times -3+4} = \frac{9+3}{-6+4} = \frac{9+3}{-6+4} = \frac{12}{-2} = -6$$

Notice that: -

1) Only when the top and bottom lines have been reduced to one number do we divide top by bottom.

2) Working needs to be shown – by the time you worked out the bottom line in your head you may well have forgotten what the top line is!

Now try these examples where $x = -5$ and $y = 2$: -

13) $\frac{4x+y}{x+3}$	**14)** $\frac{10y+4}{x+4y}$	**15)** $\frac{2x-3y}{2x+y}$	**16)** $\frac{x+10y}{x+4y}$
17) $\frac{x^2+y}{x+y}$	**18)** $\frac{x^2+y^2+1}{x+4y}$	**19)** $\frac{xy-x^2}{y-x}$	**20)** $\frac{x^3-10x}{2y+1}$

We can also solve equations which include negative numbers, for example

$2x + 3 = -17$ *Three is added……*	$3x - 6 = -33$ *Six is subtracted…..*	$4x + 20 = 4$ *Twenty is added……*
$2x = -20$ *….so subtract three*	$3x = -27$ *…..so add six*	$4x = -16$ *…so subtract twenty*
$x = -10$ *Divide by two*	$x = -9$ *Divide by three*	$x = -4$ *Divide by four*

Now try these examples: -

21) $4x + 6 = -30$

22) $5x - 2 = -22$

23) $3x + 10 = 1$

24) $4x - 4 = -20$

25) $6x + 2 = -10$

26) $7x - 2 = -30$

27) $8x + 20 = 4$

28) $5x - 5 = -30$

29) $10x - 10 = -70$

30) $9x - 3 = -30$

31) $7x + 30 = 2$

32) $6x + 12 = 0$