**Dividing fractions.**

If you ask any group of students HOW to divide two fractions such as

**5 ÷ 3**

**7 4**

the usual answer you get is **“Turn the 2nd one upside down then multiply”.**

**5 ÷ 3 = 5 × 4 = 20**

**7 4 7 3 21**

If you then ask “WHY?”, nobody knows why!

It is of little use giving explanations in words that just bamboozle students, such as ***“Dividing is the same as multiplying by the reciprocal”*** because the same question arises: “WHY?”

Here is an interesting way to EXPLAIN this:

**5 ÷ 2 = 5**

**7 3 7**

**2**

**3**

Here, we multiply by **1**

in the form of:

**3**

**1** **=** **2**

**3**

**2**

This produces….

**5 3**

**7 2**

**×**

**2 3**

**3 2**

This produces:

Hence the “rule” which says:

***To divide two fractions,***

***turn the second one upside***

***down and multiply!***

**5 3 5 × 3 = 15**

**7 × 2 = 7 2 14**

**1**

**The same idea applies to SURDS**

Consider **5 + 2√3**

**4 – √3**

Here, we multiply by **1** in the form of:

**1 =** **4 +√3**

**4 +√3**

This produces….

**(5 + 2√3) × (4 +√3)**

**(4 – √3)** **(4 +√3)**

This produces:

**20 + 13√3 + 6**

**16 – 3**

**= 26 + 13√3 = 2 +√3**

**13 13**

**The same idea even applies to COMPLEX NUMBERS**

Consider ***5 + 3i***

***4 – 3i***

Here, we multiply by **1**  in the form of:

**1 =** ***4 + 3i***

***4 + 3i***

This produces….

*(****5 + 3i) × (4 + 3i)***

***(4 – 3i) (4 + 3i)***

This produces:

***20 + 27i + 9i2***

***16 – 9i2***

***= 11 + 27i***

***25 25***