**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***