Lesson 5.2 **PROPORTIONS**

EQ: How can we use what we know about ratios and equivalent fractions to determine whether ratios are proportional?

**Proportional:** equivalent

**Proportion:** an equation stating that two ratios are equivalent.

**Determine whether RATIOS are PROPORTIONAL by reducing/simplifying them:**

**STEP 1:** Reduce/Simplify both ratios individually.

**STEP 2:** COMPARE the simplified ratios.

**STEP 3:** If they are the same: **PROPORTIONAL**

If they are NOT the same: **NOT PROPORTIONAL**

EX: , 🡪 ÷ =

= They ARE the same, so they ARE proportional!

÷ =

≠ They are NOT the same, so they are NOT proportional!

, 🡪 ÷ =

÷ =

EX:

|  |  |
| --- | --- |
| x | y |
| 1 | 12 |
| 2 | 24 |
| 3 | 36 |
| 4 | 48 |

÷ =

÷ = They ARE the same, so

÷ = they ARE proportional!

÷ =

**Cross Products**- in the proportion = 🡪 a ∙ d and b ∙ c are called CROSS PRODUCTS!

**USING CROSS PRODUCTS TO DETERMINE IF RATIOS / QUANTITIES ARE PROPORTIONAL :**

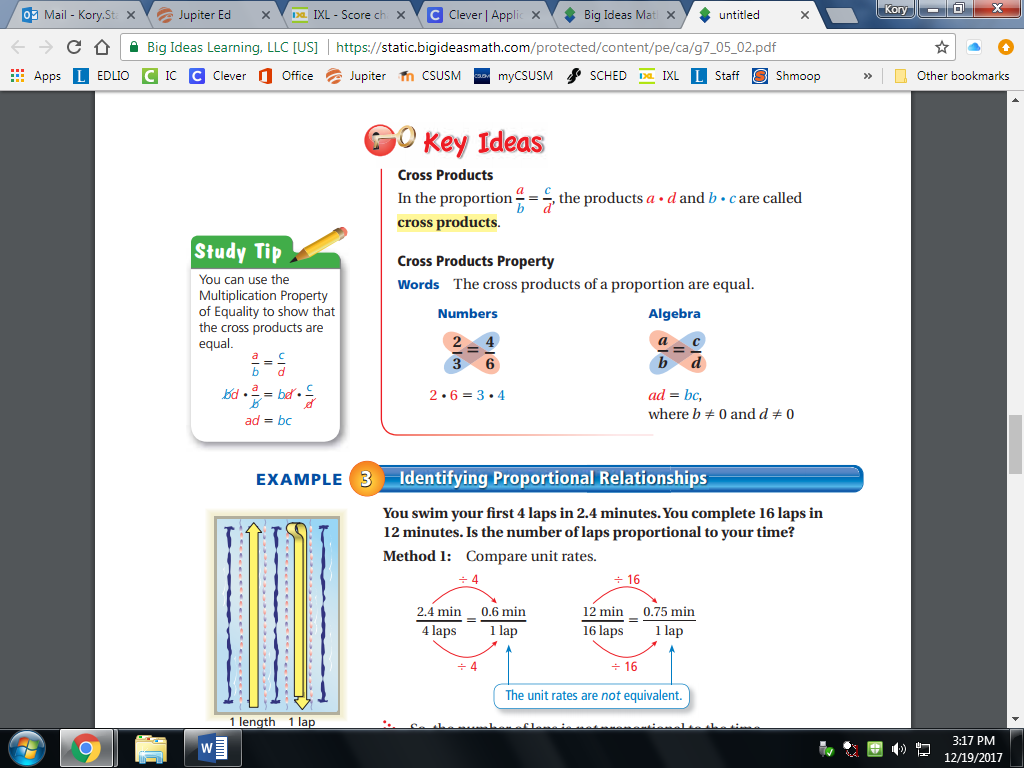
**STEP 1:** Find the CROSS PRODUCTS of two ratios.

**STEP 2:** COMPARE the CROSS PRODUCTS.

**STEP 3:** If they are the same: **PROPORTIONAL**

If they are NOT the same: **NOT PROPORTIONAL**

EX: Are the following ratios proportional?

 = 🡪 🡪 **2 ∙ 6** = 12 and **4 ∙ 3** = 12

**12 = 12**, so YES they ARE

PROPORTIONAL!

= 🡪 **1 ∙ 65** = 65 and **12 ∙ 5** = 60

**65 ≠ 60**, so NO they ARE **NOT** PROPORTIONAL!

On Your Own: Tell whether the ratios form a proportion.

**1.** , **2.** , **3.** , 4. ,

5.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Birdhouses Built, x | 1 | 2 | 4 | 6 |
| Nails Used, y | 12 | 24 | 48 | 72 |

**Lesson 5.2 PROPORTIONS**

EQ: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Proportional:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Proportion:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Determine whether RATIOS are PROPORTIONAL by REDUCING/SIMPLIFYING them:**

**STEP 1:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STEP 2:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STEP 3:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **PROPORTIONAL**

\_\_\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_NOT PROPORTIONAL**

EX:1 , 🡪

, 🡪

EX2:

|  |  |
| --- | --- |
| x | y |
| 1 | 12 |
| 2 | 24 |
| 3 | 36 |
| 4 | 48 |

**Cross Products**- in the proportion = 🡪 \_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Determine whether RATIOS are PROPORTIONAL using CROSS PRODUCTS:**

**STEP 1:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

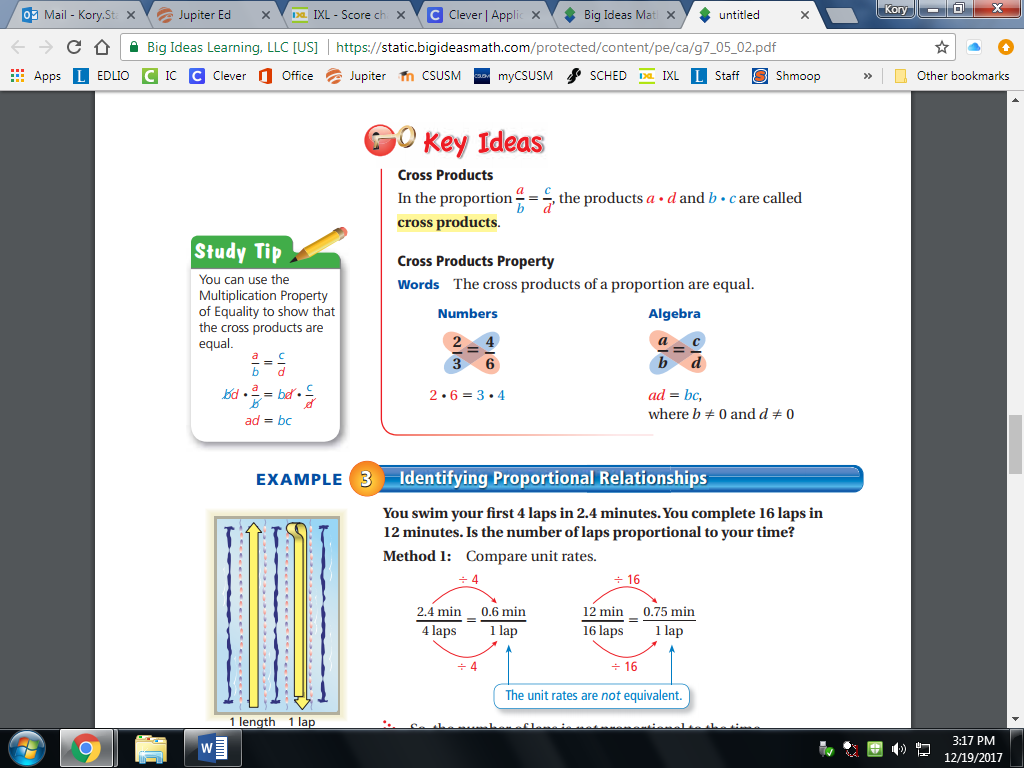
**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**STEP 2:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STEP 3:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: **PROPORTIONAL**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: **NOT PROPORTIONAL**

EX: Are the following ratios proportional?

 = 🡪 🡪

= 🡪

Do these ratios form a proportion?

1. , **2.** , **3.** , **4**. ,

5.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Birdhouses Built, x | 1 | 2 | 4 | 6 |
| Nails Used, y | 12 | 24 | 48 | 72 |