# 7 - CHAPTER 1: RATIOS AND PROPORTIONAL REASONING - NOTE PACKET

NAME: _____ HOUR: _____

## Lesson 1.1: Rates

| Vocabulary | |
|---|---|
| Term | Definition |
| Rate | A ratio that compares two quantities (amounts) with different units |
| Unit Rate | A simplified rate that has a denominator of 1 $\frac{\text{Numerator}}{\text{Denominator}}$ |

## Lesson 1.2: Complex Fractions and Unit Rates

| Vocabulary | |
|---|---|
| Term | Definition |
| Complex Fraction | Fractions with a numerator, denominator, or both that are also fractions. $\frac{20}{\frac{1}{2}}$ |

How to make a whole number a fraction:

Put a one in the denominator $\frac{20}{1}$

How to divide fractions: $\frac{1}{4} \div 2$

| Keep | Change | Flip |
|---|---|---|
| $\frac{1}{4}$ | $\times$ | $\frac{1}{2}$ |

## Lesson 1.3: Convert Rates

| Vocabulary | |
|---|---|
| Term | Definition |
| Dimensional Analysis | The process of including units of measure as factors |

How to complete dimensional analysis:

$$\frac{60 \text{ ~~miles~~}}{1 \text{ hour}} \cdot \frac{5,280 \text{ ft}}{1 \text{ ~~mile~~}} = \frac{316,800 \text{ ft}}{1 \text{ hours}}$$

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## Lesson 1.4: Proportional and Nonproportional Relationships

| Vocabulary | |
|---|---|
| Term | Definition |
| Proportional | When two quantities have a constant ratio or unit rate |
| Nonproportional | When two quantities don't have a constant ratio or unit rate |
| Equivalent Ratios | $\frac{3}{4} = \frac{6}{8} = \frac{12}{16} = 0.75$ |

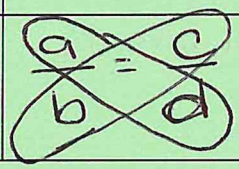
## Lesson 1.5: Graph Proportional Relationships

How to determine if a relationship is proportional when looking at a graph...

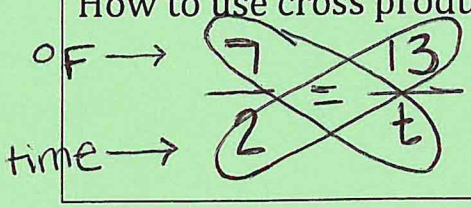
- if the line goes through the origin (0,0)
- the line is straight

| Vocabulary | |
|---|---|
| Term | Definition |
| Origin | The beginning of the graph (0,0) |

## Lesson 1.6: Solve Proportional Relationships

| Vocabulary | |
|---|---|
| Term | Definition |
| Proportion | an equation that says two ratios/rates are equal $\frac{6}{8} = \frac{3}{4}$ $\frac{a}{b} = \frac{c}{d}$ $b \neq 0$ $d \neq 0$ |
| Cross Products |  $ad = bc$ |

How to use cross products to solve proportions...




$2 \cdot 13 = 7t$

$\frac{26}{7} = \frac{7t}{7}$

$3.7 \approx t$

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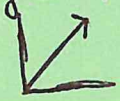
## Lesson 1.7: Constant Rate of Change

| Vocabulary | |
|---|---|
| Term | Definition |
| Rate of Change | is a rate that describes how one quantity changes in relation to another |
| Constant Rate of Change | When the rate of change is the same every time  |

**Solving proportions using...**

**Tables**

| Carpets Plus | |
|---|---|
| Time (Days) | Cost ($) |
| 2 | 30 |
| 3 | 45 |
| 4 | 60 |

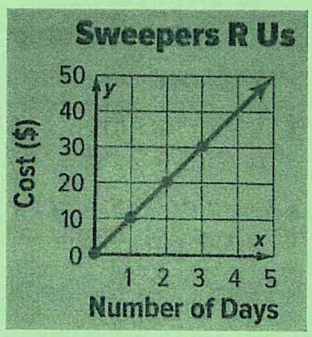
+1, +1 (Time (Days)); +15, +15 (Cost ($))

$\frac{\$15}{1 \text{ day}} = \frac{15}{1}$

**Graphs**

$\frac{10}{1} = 10$

$\frac{20}{2} = 2$




## Lesson 1.8: Slope

| Vocabulary | |
|---|---|
| Term | Definition |
| Slope | the rate of change between any two points on a line. $\frac{\text{Rise}}{\text{Run}} = \frac{\text{change in } y}{\text{change in } x}$ |

## Lesson 1.9: Direct Variation

| Vocabulary | |
|---|---|
| Term | Definition |
| Direct Variation | the ratio of $y$ to $x$ is a constant, $k$ meaning there is a constant ratio $y = kx$ |
| Constant of Variation | Constant ratio $= \frac{y}{x}$ |