Recognizing Proportional Relationships

Key

❖ To decide if two quantities are in a proportional relationship...
  ▪ Use cross products!!!

This is not a proportional relationship

$$\frac{3}{8} \neq \frac{5}{6}$$

$3 \times 6 = 18$

$5 \times 8 = 40$

$18 \neq 40$

$$\frac{4}{6} = \frac{6}{9}$$

$36 = 36$

This **IS** a proportional relationship!

  ▪ Test for equivalent ratios in a table and find the scale factor (also called the *constant of proportionality* and the *unit rate*!)

×25

T	D
2	50
3	75
5	125
7	175
8	200

The scale factor is 25!

$D = 25T$

×3

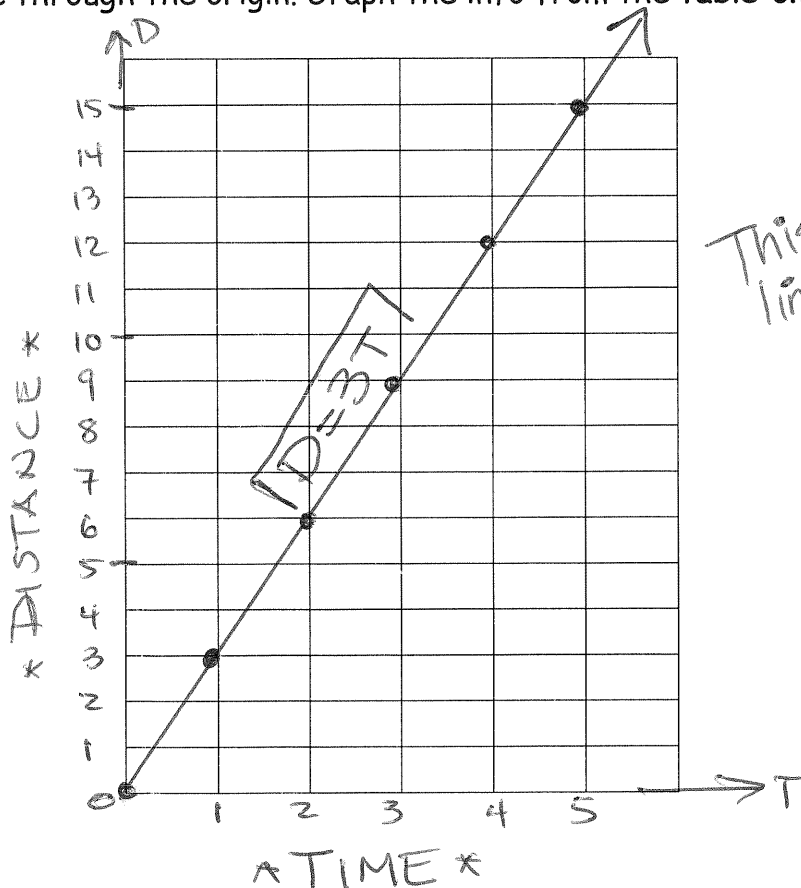| T	D
1	3
2	6
3	9
4	12
5	15

The scale factor is 3!

$D = 3T$

  ▪ Graph on a coordinate plane and observe whether the graph is a straight line through the origin. Graph the info from the **table on the right**.

This is a straight line through the origin D=3T, the table on the right

IS a proportion relationship!

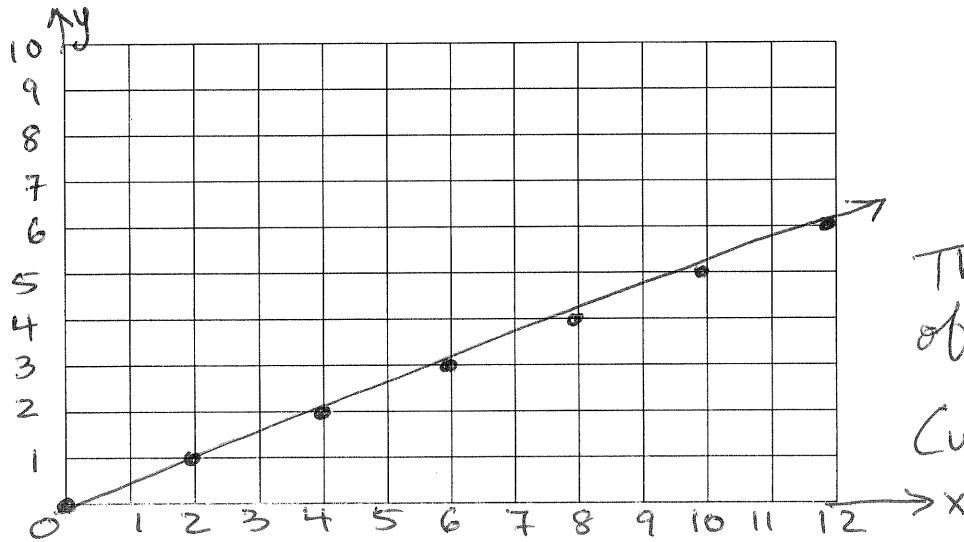❖ Can you identify the constant of proportionality (unit rate)...

▪ In a table?

Number of Dogs	0	1	2	3	4
Amount of Toys	0	2	4	6	8

⟩ x2

The constant of proportionality is 2!

×8

Hours	$
2	16
3	24
7	56
8	64
9	72
12	96

The constant of proportionality is 8.

▪ On a graph?

The constant of proportionality is ½!

(up one, over 2)

▪ In an equation?

The constant of proportionality is 3!

$$Y = 3x$$

▪ From a diagram?

The constant of proportionality is × 3

Ü

▪ From a verbal description?

Ex. 1... The amount of money that Susie earns is twice the amount of money that her little brother earns.   ×2

Ex. 2... The distance a person travels is 50 times the number of hours.   ×50

Ex. 3... The total cost t, is proportional to the number n of items purchased at a constant price p. First, represent this proportional relationship in an equation. Then identify the constant of proportionality. $t = pn$

p is the constant of proportionality