Proportional Reasoning

Ratio

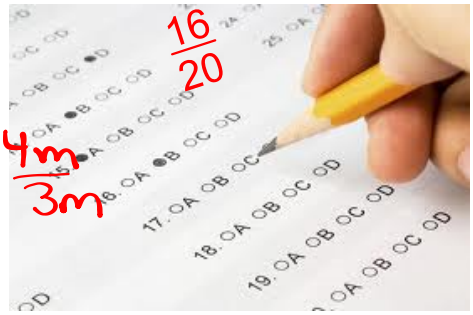
Rate

Proportion

Can you recall what these are??

Ratio:

Example:



$= \frac{4m}{3m}$

Rate:

Ex: $\frac{\text{distance}}{\text{time}} = \frac{60\text{km}}{1\text{hr}}$

Proportion:

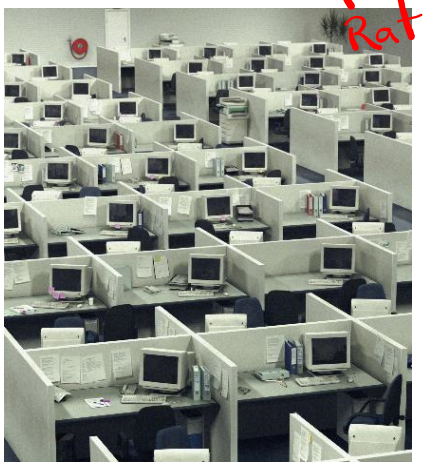
$\frac{3}{6} = \frac{1}{2}$

State two more ways to write the ratio 3/4.

$\frac{3}{4} = \frac{6}{8} = \frac{15}{20}$

$3:4 = 6:8 = 15:20$

Jean-Luc, a builder, works in Kentville, Nova Scotia. He has found that he can arrange the work cubicles of his employees best if the ratio between the length and the width of a room is 20:2. If a room is 6 m long, how wide should the room be?



Ratio (20/2) length

1. State the variable and Set up ratio.

Let Width = x

$$\frac{\text{Length}}{\text{Width}}$$

2. Fill in ratio (Fill in what you know)

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

Jean-Luc, a builder, works in Kentville, Nova Scotia. He has found that he can arrange the work cubicles of his employees best if the ratio between the length and the width of a room is 20:2. If a room is 6 m long, how wide should the room be?

Length / Width

3. Use ratio to create proportion.

$$\frac{20}{2} = \frac{6}{x}$$

4. Solve for the unknown.

$$\frac{20}{2} = \frac{6}{x}$$

$$\frac{20x}{20} = \frac{12}{20}$$

$$x = \frac{12}{20} = \frac{6}{10} = \frac{3}{5} = 0.6$$

The width should be 0.6m.

If halibut steaks cost $2.49 for 94 g, how much will it cost to buy 250 g of halibut steaks?

1. State the variable and Set up ratio or rate.
2. Fill in rate
3. Use rate to create proportion.
4. Solve for the unknown.

① Let cost = x

cost
weight

② $\frac{\$2.49}{94\,g}$

③ $\frac{\$2.49}{94\,g} = \frac{x}{250\,g}$

④ $\frac{622.5}{94} = \frac{94x}{94}$

$\$6.62 = x$

Recipe #1

3 cups of concentrate
7 cups of water

If you only have 2 cups of concentrate of recipe #1, how many cups of water will you need?

① Let cups of water = x

$$\frac{\text{cups of concentrate}}{\text{cups of water}}$$

② $\frac{3}{7}$

③ $\frac{3}{7} = \frac{2}{x}$

④ $\frac{3x}{3} = \frac{14}{3}$

$x = 4.\overline{6}$

You Try!!

A chainsaw's engine uses a mixture of 31 L of gas to 2 L of oil. How much oil must you mix with 15 L of gas?

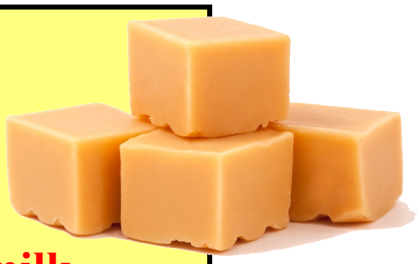
Page 21, Questions 1-7 **(Omit #4)**

Recipe #2

2 cups of concentrate
5 cups of water

If you had 5 cups of concentrate of recipe #2, how many cups of water will you need?

Fudge Recipe



1/2 cups of brown sugar
3 cups of white sugar
1 3/4 cups of condensed milk
1 cup of butter

a) What is the ratio of butter to white sugar?

b) What is the ratio of brown sugar to white sugar?

Ultimate Question

c) Choose the correct answer that represents the ratio of condensed milk to butter?

i) 3/4 ii) 7/4 iii) 2/5 iv) 7/2

Recipe #1

3 cups of concentrate
7 cups of water

You only want to make 8 cups of Recipe #1. How many cups of concentrate and how many cups of water will you need? Explain your solution.

- **This is a question dealing with totals!!!!!!**
- **We will determine the total of the batch & set up a total ratio.**

Recipe Total

# of concentrate =
# of water =

Total # =

Recipe #1
3 cups of concentrate
7 cups of water

You only want to make 8 cups of Recipe #1. How many cups of concentrate and how many cups of water will you need? Explain your solution.

Recipe Total

# of concentrate = 3
# of water = 7

Total # = 10

Total Ratio

Let x = concentrate

$$\frac{\text{\# of concentrate}}{\text{Total}}$$

Recipe #1

3 cups of concentrate
7 cups of water

You only want to make 8 cups of Recipe #1. How many cups of concentrate and how many cups of water will you need? Explain your solution.

Recipe Total

# of concentrate = 3
# of water = 7

Total # = 10

Total Ratio

Let x = concentrate

$$\frac{\text{\# of concentrate}}{\text{Total}}$$

$$\frac{3}{10} = \frac{x}{8}$$

$$10x = 24$$

$$x = 2.4$$

2.4 Cups of Concentrate

Water = Total # - Concentrate

Water =

Water =

Cups of Water!!!!

Recipe #2

2 cups of concentrate
5 cups of water

You want to make 12 cups of Recipe #2. How many cups of concentrate and water will you need?

Recipe Total

# of concentrate =
# of water =

Total # =

Recipe #2

2 cups of concentrate
5 cups of water

You want to make 12 cups of Recipe #2. How many cups of concentrate and water will you need?

Recipe Total

# of concentrate = 2
# of water = 5

Total # = 7

Total Ratio

Let x =

$\frac{\quad}{\quad} = \frac{\quad}{\quad}$

→

→ **x =**

Recipe #2
2 cups of concentrate
5 cups of water

You want to make 12 cups of Recipe #2. How many cups of concentrate and water will you need?

Recipe Total

# of concentrate = 2
# of water = 5

Total # = 7

Total Ratio

Let x = concentrate

$$\frac{\text{\# of concentrate}}{\text{Total}} = \frac{2}{7} = \frac{x}{12}$$

$$7x = 24$$

$$x = 3.4 \text{ cups}$$

Water =

Water

Water =

Fruit Juice Recipe
2 cups pineapple juice
3 cups cranberry juice
5 cups apple juice

You need to make only 4 cups of juice for a taste test.
How much of each ingredient will you need?

Batch Total

# of pineapple =
# of cranberry =
# of apple =

Total # =

Fruit Juice Recipe
2 cups pineapple juice
3 cups cranberry juice
5 cups apple juice

You need to make only 4 cups of juice for a taste test. How much of each ingredient will you need?

Recipe Total

of pineapple = 2
# of cranberry = 3
# of apple = 5

Total # = 10

Total Ratio

Let x =

Fruit Juice Recipe
2 cups pineapple juice
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You need to make only 4 cups of juice for a taste test. How much of each ingredient will you need?

Recipe Total

of pineapple = 2
# of cranberry = 3
# of apple = 5

Total # = 10

Total Ratio

Let x = pineapple

$$\frac{\text{\# of pineapple}}{\text{Total}}$$

$$\frac{2}{10} = \frac{x}{4}$$

$$10x = 8$$

$$x = 0.8$$

Total Ratio

Let y =

=

=

y =

0.8 cups of pineapple

Fruit Juice Recipe
2 cups pineapple juice
3 cups cranberry juice
5 cups apple juice

You need to make only 4 cups of juice for a taste test. How much of each ingredient will you need?

Batch Total

# of pineapple = 2
# of cranberry = 3
# of apple = 5

Total # = 10

Total Ratio

Let x = pineapple

$\frac{\text{\# of pineapple}}{\text{Total}}$

$\frac{2}{10} = \frac{x}{4}$

$10x = 8$

$x = 0.8$

0.8 cups of pineapple

Total Ratio

Let y = cranberry

$\frac{\text{\# of cranberry}}{\text{al}}$

$\frac{3}{10} = \frac{y}{4}$

$10y = 12$

$y = 1.2$

1.2 cups of cranberry

Apple =

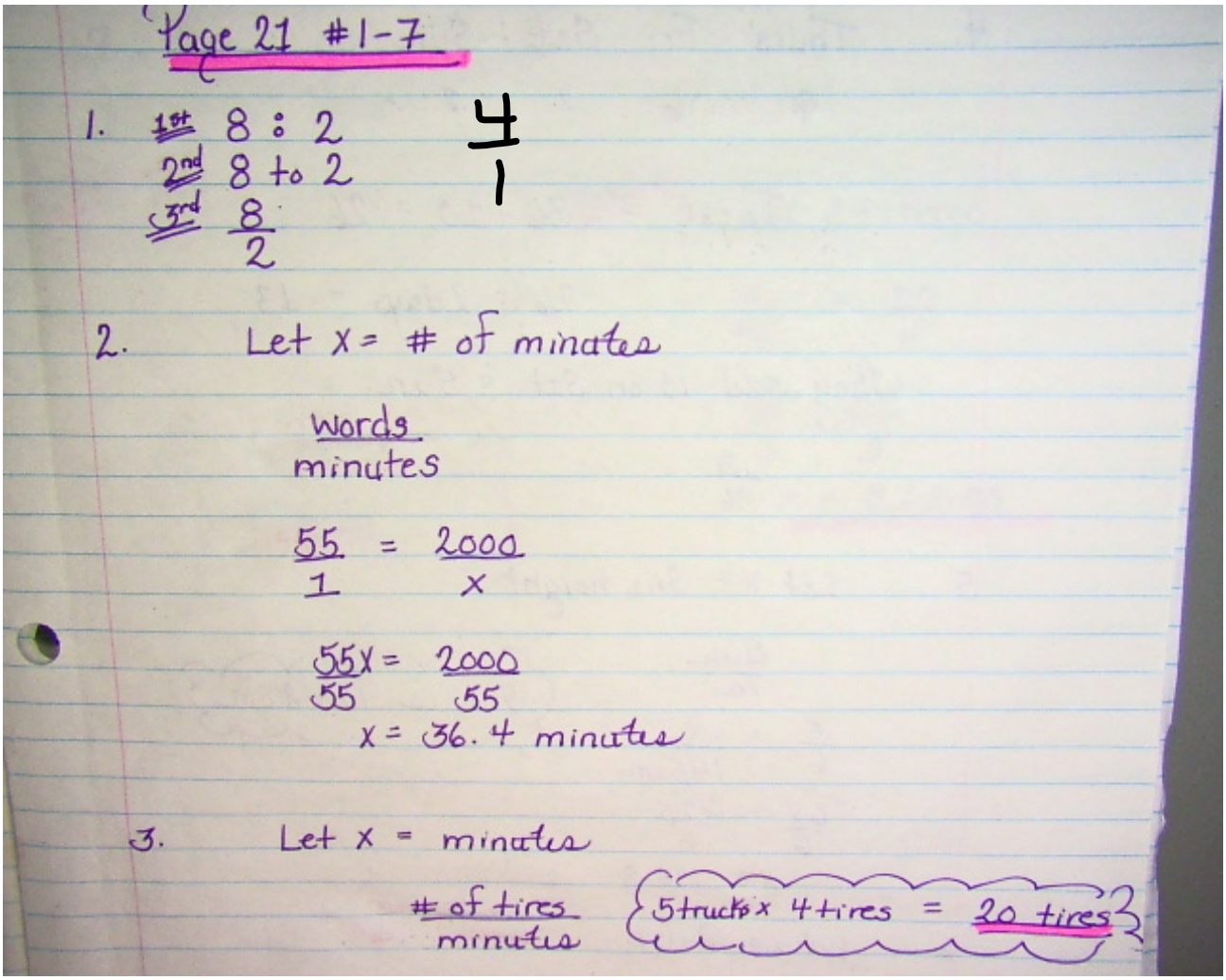
=

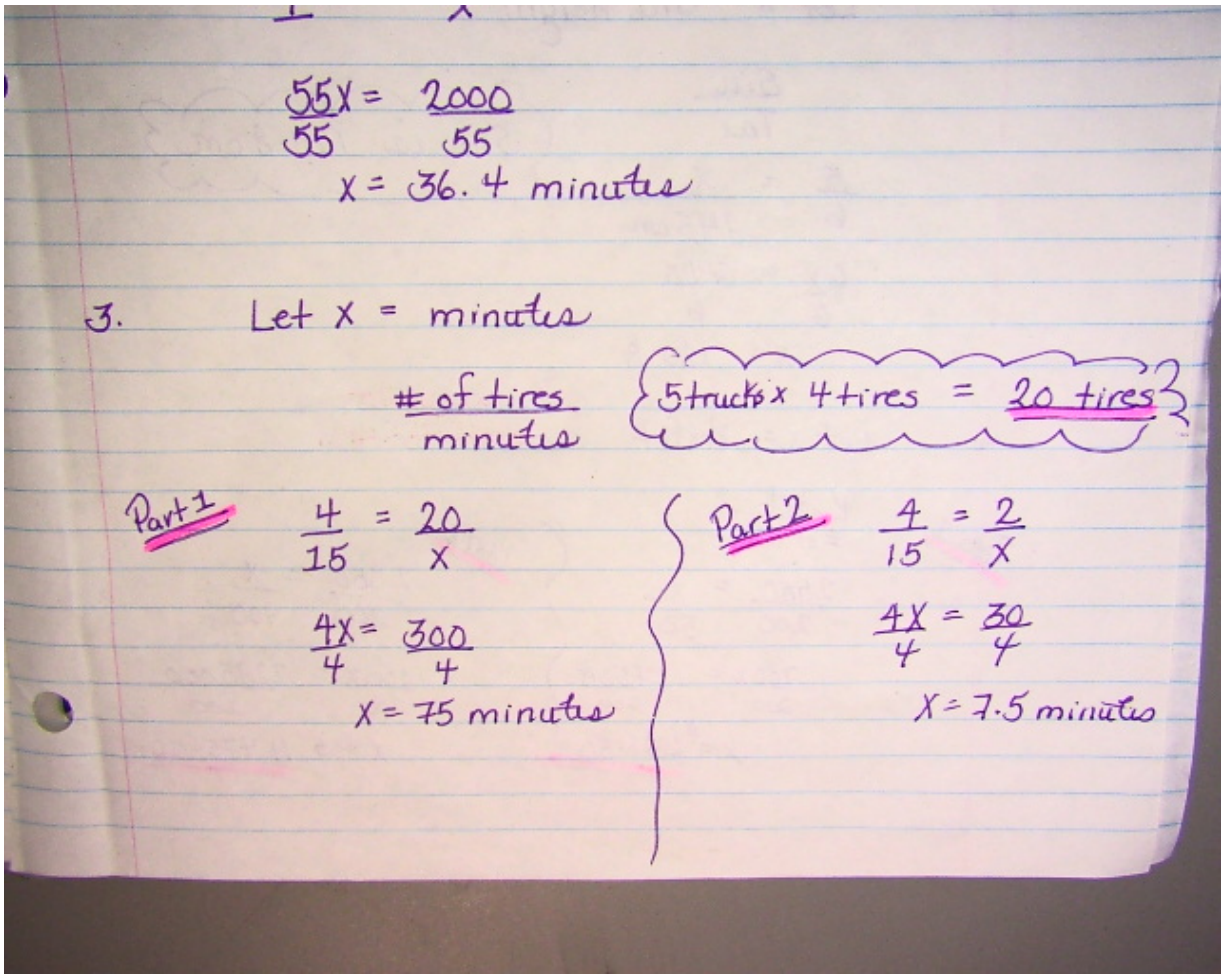
cups of apple

Recipe #1
3 cups of concentrate
7 cups of water

Recipe #2
2 cups of concentrate
5 cups of water

A company has produced orange juice concentrate that is packaged in 1 cup portions. Buyers will mix the concentrate with water, and the best proportions of concentrate needs to be identified.


Page 21 #1-7
1. 1st 8 : 2
2nd 8 to 2
3rd 8/2
4/1
2. Let x = # of minutes
Words
minutes
55/1 = 2000/x
55x/55 = 2000/55
x = 36.4 minutes
3. Let x = minutes
# of tires
minutes
5 trucks x 4 tires = 20 tires



$\frac{55x}{55} = \frac{2000}{55}$

$x = 36.4$ minutes

3. Let x = minutes

$\frac{\#\text{ of tires}}{\text{minutes}}$ {5 trucks x 4 tires = 20 tires}

Part 1

$\frac{4}{15} = \frac{20}{x}$

$\frac{4x}{4} = \frac{300}{4}$

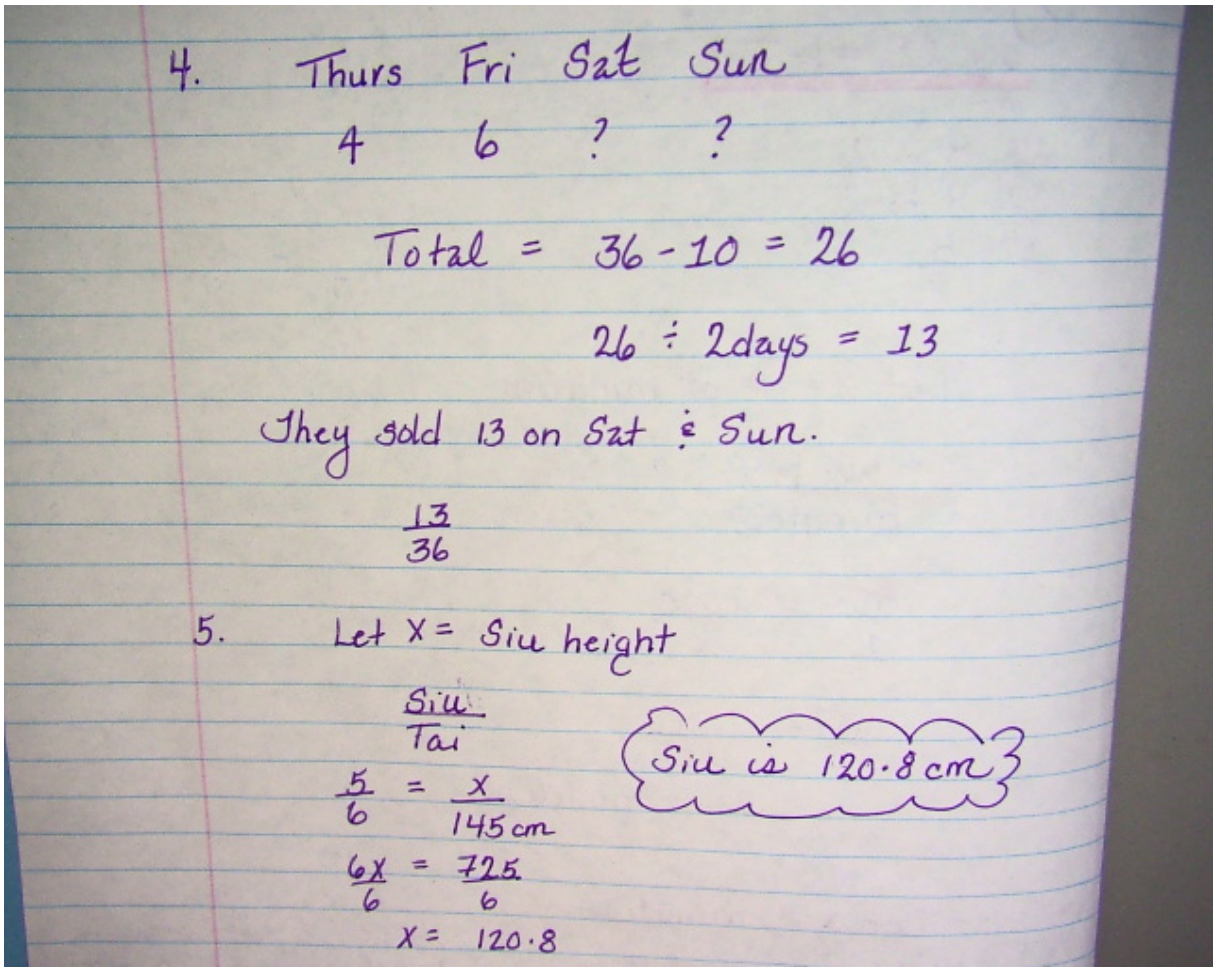
$x = 75$ minutes

Part 2

$\frac{4}{15} = \frac{2}{x}$

$\frac{4x}{4} = \frac{30}{4}$

$x = 7.5$ minutes



4. Thurs Fri Sat Sun

4 6 ? ?

Total = 36 - 10 = 26

26 ÷ 2days = 13

They sold 13 on Sat & Sun.

$\frac{13}{36}$

5. Let X = Siu height

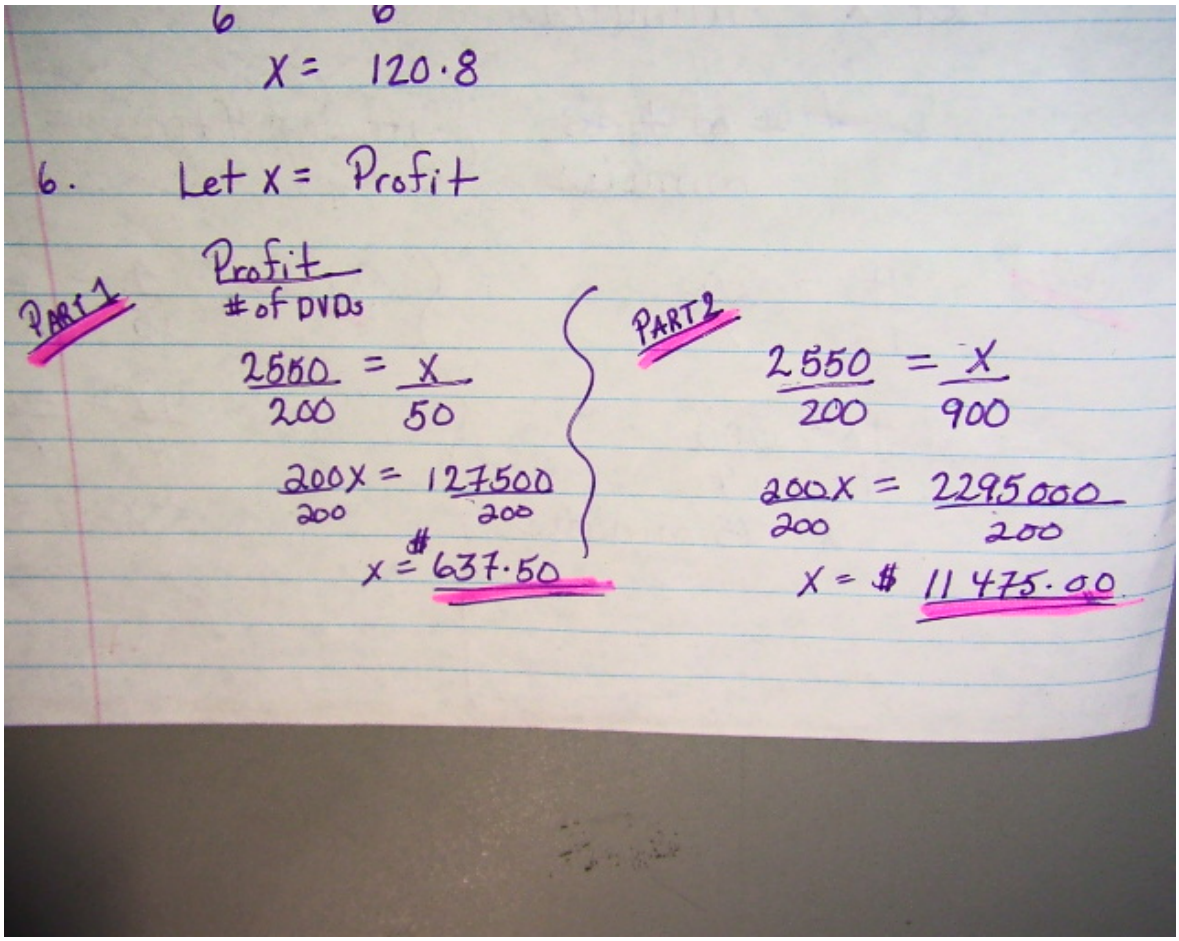
$\frac{\text{Siu}}{\text{Tai}}$

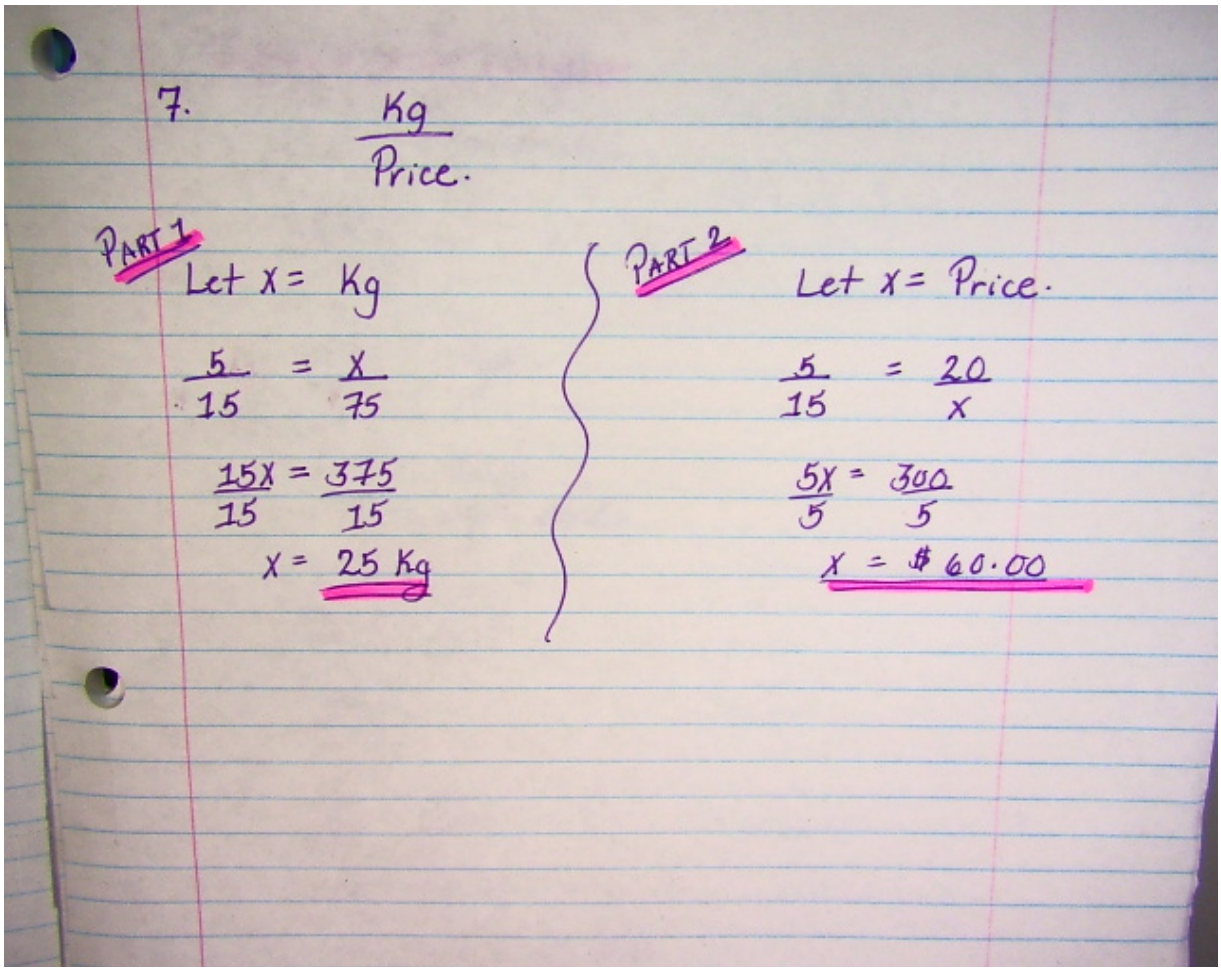
$\frac{5}{6} = \frac{x}{145\text{ cm}}$

$\frac{6x}{6} = \frac{725}{6}$

$x = 120.8$

Siu is 120.8 cm


6 6
X = 120.8
6. Let X = Profit
Profit
# of DVDs
PART 1
2550/200 = X/50
200X/200 = 127500/200
X = $637.50
PART 2
2550/200 = X/900
200X/200 = 2295000/200
X = $11475.00


7.
Kg
Price.
PART 1
Let x = Kg
5/15 = x/75
15x/15 = 375/15
x = 25 Kg
PART 2
Let x = Price.
5/15 = 20/x
5x/5 = 300/5
x = $60.00