

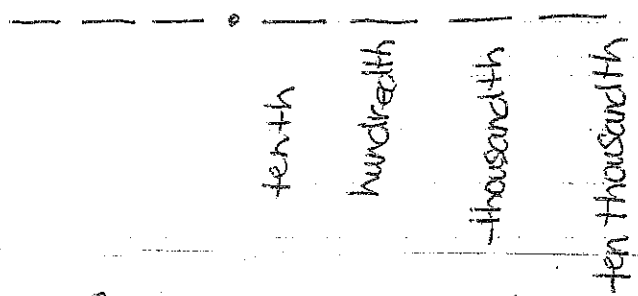
5.1

Write a % as a decimal

$$7\% = \frac{7}{100} = 7 \div 100 = 0.07$$

Write a decimal as a fraction

* * remember place value



So if a number looks like:

$$0.2 = \frac{2}{10} \quad (\text{don't forget to reduce})$$

↑ tenths place →

$$\frac{2}{10} = \frac{1}{5}$$

$$0.35 = \frac{35}{100} = \frac{7}{20}$$

↑ hundredth place →

$$0.298 = \frac{298}{1000} = \frac{149}{500}$$

↑ thousandth place →

Write a fraction as a decimal & %

decimal $\frac{5}{8} = 5 \div 8 = 0.625$ (\div top by the bottom)

percent $\frac{5}{8} = 5 \div 8 = 0.625 \times 100 = \underline{\underline{62.5\%}}$

5.3

Solving Percent Problems

* Percent is always over 100

① → Set up problem as equivalent fractions

ex 70% of a number is 63

↑
When you see this
this means that you don't
know the original number

① Set up as equiv. fractions

$$\frac{70}{100} = \frac{63}{x}$$

② Multiply across diagonally

$$\frac{70}{100} = \frac{63}{x}$$

left over

③ divide by the number left over

$$(100 \times 63) \div 70 = 90$$

ex 2

175% of a number is 105

① $\frac{175}{100} = \frac{105}{x}$

② 100×105

③ $\div 175$

$$= 60$$

NOTE
increase means add
decrease means subtract

ex 3

A length of 30cm is increased by 40%. What is the new length?

- ① ⇒ find out what 40% of 30cm equals
- ② add to original length (it says increase)

To find % put into decimal then x

$$\textcircled{1} \quad 40\% = \frac{40}{100} = 0.4$$

$$0.4 \times 30 = 12$$

$$\textcircled{2} \quad 12 + 30 = 42 \text{ cm (new length)}$$

ex 4

The price of a juice in the vending machine increased from \$1.25 to \$1.75. What was the % increase.

- ① calculated how much the increase was.
(1.75 - 1.25 = 0.50 increase)

- ② set up as 2 equal fractions

$$\frac{X}{100} = \frac{0.50}{1.25} \leftarrow \text{increase}$$

\leftarrow always orig. cost

- ③ cross multiply then \div like ex. 1

$$\frac{X}{100} \rightarrow \frac{0.50}{1.25}$$

$$100 \times 0.50 \div 1.25$$

$$= 40\% \text{ increase.}$$

5.4

Sales Tax & Discount

Sales Tax - is added on like an increase

Discount - is subtracted like a decrease.

The steps for finding both are:

- ① put percent into a decimal
- ② multiply decimal by cost (\$)
- ③ add if it is taxes
subtract if it a discount

ex

A sweater cost \$65.00
It is on sale for 30% off
The taxes are 12%.

$$\begin{array}{r} \$65.00 \\ \times 0.3 \\ \hline \end{array}$$

$$30\% = \frac{30}{100} = 0.3$$

19.50 ← discount

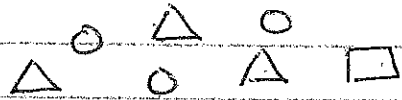
$$\begin{aligned} \text{Sale Price} &= \text{orig price} - \text{discount} \\ &= 65.00 - 19.50 = \$45.50 \end{aligned}$$

$$12\% \text{ tax} = \frac{12}{100} = 0.12$$

$$\begin{aligned} \text{Sale price} \times \text{tax in decimal} &= \text{taxes added} \\ 45.50 \times 0.12 &= 5.46 \quad \text{Final price} = 45.50 + 5.46 = 50.96 \end{aligned}$$

5.5 Ratios

Ex



part to whole ▷

triangles to all ▷ 3:7

part to part

triangles to squares ▷ 3:1

3 term

* always is same order as question
triangles to squares to circles ▷ 3:1:3

Ratio to Fraction

$$\begin{array}{c} 3:5 = \frac{3}{5} \\ \uparrow \\ \text{top} \end{array}$$

Fraction to Ratio

$$\frac{12}{19} \Rightarrow 12:19$$

5.6 Equivalent Ratios

Just like fractions - Ratios can reduce

$$\frac{10}{12} = \frac{5}{6} \leftarrow \text{these are equivalent fractions}$$

1:2 and 4:8 are equivalent ratios
 $\begin{array}{c} \uparrow \quad \uparrow \\ 1 \times 4 \quad 2 \times 4 \end{array}$

5.7 Comparing Ratios

The easiest way to compare ratios is to reduce the ratio so one of the terms = 1

Compare

* divide both by smallest number

$$200g : 9m^2$$

→ both by 9 to make one term = 1

$$\frac{200}{9} : \frac{9}{9}$$

$$22.\bar{2} : 1$$

$$150g : 6.5m^2$$

÷ by 6.5 to make 1 term = 1

$$\frac{150}{6.5} : \frac{6.5}{6.5}$$

$$23 : 1$$

* Writing a part : part
as part : whole

$$\text{part : part ratio} = 2 : 3 \text{ vs } 4 : 5$$

So new ratios

$$\text{part : whole} = 2 : 5$$
$$= 4 : 9$$

add to get whole

$$2 + 3 = 5$$

Can compare now by changing into a fraction.

$$\Rightarrow \frac{2}{5} \text{ or } 0.4 \text{ or } 40\% \text{ vs } \frac{4}{9} = .\bar{44} \text{ or } 44\%$$

5.8 Solving Ratio Problems

Treat like fractions:

$(5:x=40:56)$ $\frac{5}{x} = \frac{40}{56}$ ← ask what do I do to 5 to get 40?

→ $5 \times 8 = 40$

$\xrightarrow{\times 8}$ $5 \times 8 = 40$

$\xleftarrow{\div 8}$ go backwards \div
 $40 \div 8 = 5$

So $56 \div 8 = 7$ $x = 7$

5.10 Comparing Rates

always divide \$ by # of things

*money goes on top!

ex which is a better deal?

(A) \$ 4.69 for 450g

(B) \$ 6.49 for 600g

(C) \$ 7.89 for 1000g

} find out \$ per gram by dividing \$/g

(A) $\frac{\$4.69}{450g}$

(B) $\frac{6.49}{600g}$

(C) $\frac{\$7.89}{1000g}$ *best price

for 100g $\times 100$
 $= \$0.0104/g$
 $= \$1.04/100g$

$= 0.0108/g$
 $= \$1.08/100g$

$0.00789/g$
 $= \$0.79/100g$

Compare wages

$$\text{\$} \div \text{time} = \text{\$/hr}$$

- (A) \\$ 7.50 for 1 hour
- (B) \\$ 25.00 for 3 hours
- (C) \\$ 44.00 for 5 hours

$$\text{(A)} \quad \frac{\text{\$} 7.50}{1} = \text{\$} 7.50/\text{hr}$$

$$\text{(B)} \quad \frac{\text{\$} 25.00}{3} = \text{\$} 8.33/\text{hr}$$

$$\text{(C)} \quad \frac{44.00}{5 \text{ hr}} = \text{\$} 8.80/\text{hr}$$

Compare speed

* think about how we say it

$$50 \text{ km/h}$$

← this is a divide sign!!!

* so to find out the speed of a car that goes 450 km in 5 hours

$$\frac{\text{km}}{\text{h}} = \frac{450}{5} = 90 \text{ km/h}$$