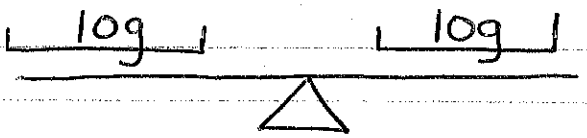
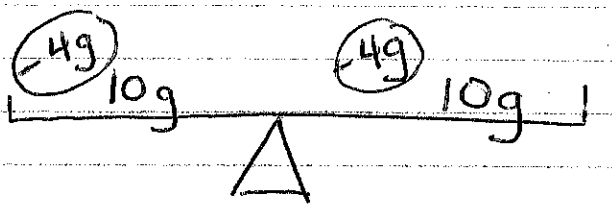
Math 8 - Chapter 6 notes

using a scale to model equations



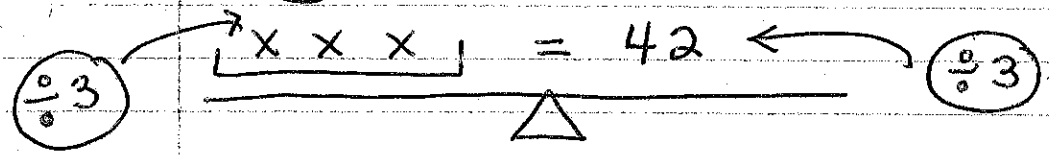
scales are balanced



to keep scales balanced - whatever you do to one side you must do to the other side

So when we solve equations

$3x = 42$



Result

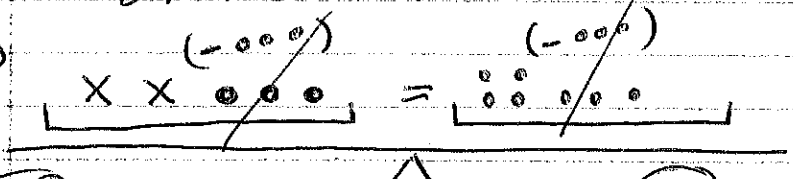
$x = 14$

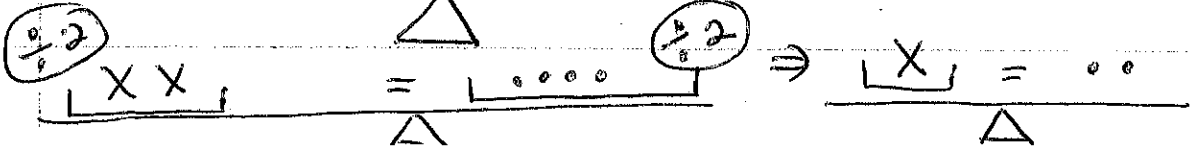
ex 2 * When solving use BEDMAS ←

in other words do addition or subtraction then multiplication + division and so on ....

$2x + 3 = 7$

①





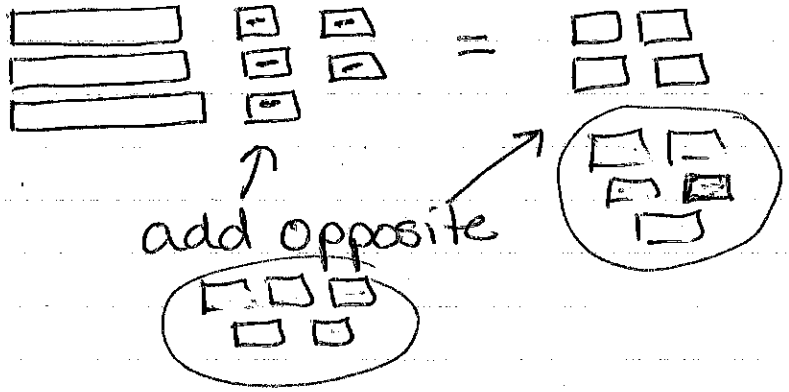
$x = 2$

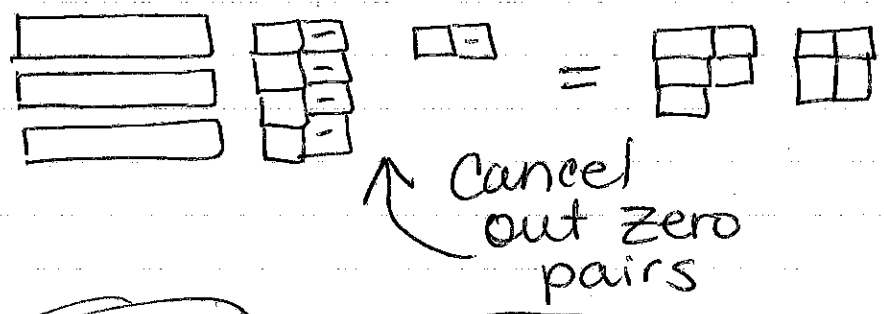
Using tiles (in book yellow = +1, red = −1)

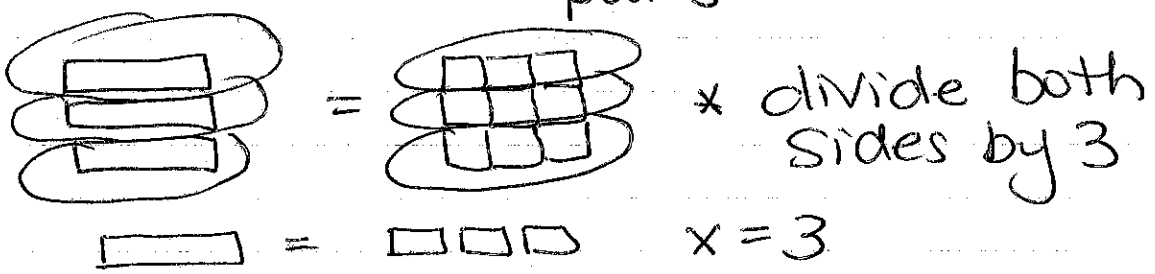
□ = +1 ▭ = −1

▭ = x ▭ = −x

Model equation $3x - 5 = 4$







Using Algebra (do the opposite)

* goal get x by itself

* backwards BEDMAS

$16t - 69 = -13$ ← get rid of 1st

$+69 \quad +69$ ↖ do opposite to both sides

$16t = 56$

opposite = ÷ 16 ÷ 16

$t = 3.5$

6.3 Equations with Fractions

Fractions mean divide:

Recall $\frac{25}{5} = 25 \div 5 = 5$

* so when solving an equation with a fraction - think of it as divide and to get rid of it - the opposite is multiply.

ex 1 $\frac{n}{4} = 5 \xrightarrow{\times 4} \frac{4n}{4} = 5 \times 4 \quad n = 20$

dividing so $\times 4$

ex 2 * remember backwards BEDMAS
* start ⓐ add/subtract

$\frac{c}{40} + 6 = 26 \xrightarrow{-6} \frac{c}{40} = 20 \xrightarrow{\times 40}$

$\xrightarrow{\times 40}$

$\Rightarrow c = 800$

6.4 / 6.5 The Distributive Property

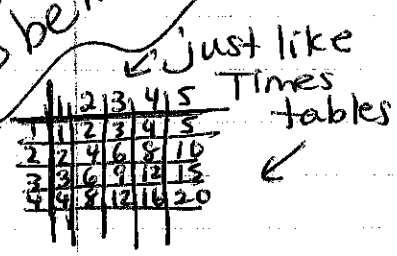
This means what ever is on the outside of the brackets needs to be distributed to the things inside the brackets

$3(x+4) \Rightarrow 3 \cdot x + 3 \cdot 4$

$= 3x + 12$

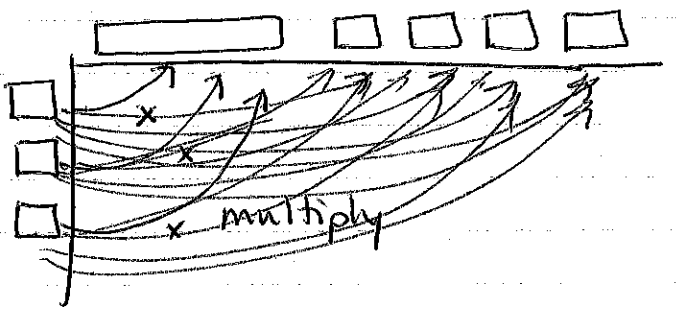
* don't forget that all things inside need to be multiplied

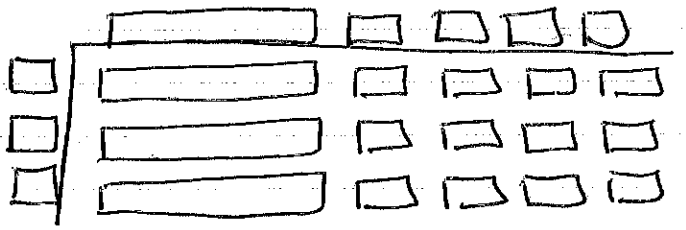
multiplying using Algebra Tiles



↙ Just like Times tables ↙

	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20





$= 3x + 12$.

6.6 Create a Table of Values

To create a table of values, plug in values for x and find y.

ex 1 $y = 2x + 3$

x	$y = 2x + 3$
-2	$2(-2)+3 = -4+3 = -1$
-1	$2(-1)+3 = -2+3 = 1$
0	$2(0)+3 = 0+3 = 3$
1	$2(1)+3 = 2+3 = 5$
2	$2(2)+3 = 4+3 = 7$

$\Rightarrow$

x	y
-2	-1
-1	1
0	3
1	5
2	7

ex 2

$y = 20 - 3x$

x	$y = 20 - 3x$
1	$20 - 3(1) = 17$
2	$20 - 3(2) = 14$
3	$20 - 3(3) = 11$
4	$20 - 3(4) = 8$
5	$20 - 3(5) = 5$

$\Rightarrow$

	x	y	
+1	1	17	−3
+1	2	14	−3
+1	3	11	−3
+1	4	8	−3
	5	5	

PATTERN $\Rightarrow$ as x goes up by 1 $\Rightarrow$ y goes down by 3

When the change is constant this is a linear relation.

6.7 Graphing Linear Relations

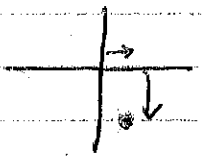
Points are always listed (x, y)

x is ⟷ left or right
(−) (+)

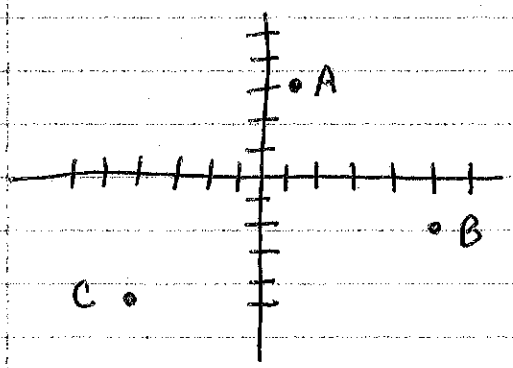
y is ↕ up or down
(+) (−)

(−2, 4) means left 2 or ← 2
and up 4 or ↑ 4

(1, −2) means right 1 or → 1
then down 2 or ↓ 2



Naming Points (x, y)



A → over 1, up 3; (1, 3)

B → over 5, down 2; (5, −2)

C ← back 4, down 5 (−4, −5)

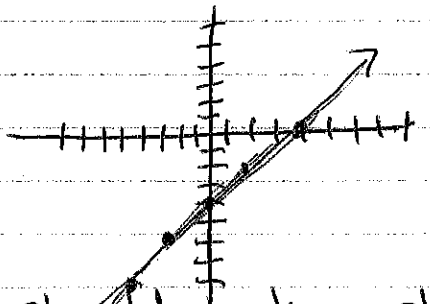
To graph a linear Relation: $y = x - 4$

① make a table of values

② graph points

pick any 4 points in a pattern

x	y = x − 4
−4	−8
−2	−6
0	−4
2	−2
4	0



* should make a straight line (if not recheck table!)