

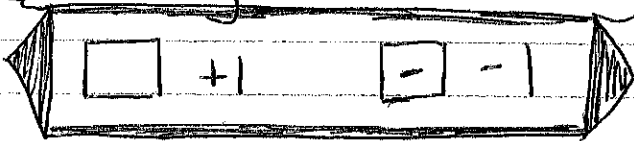
Math 8 - Ch 2 notes

2.1

Review from grade 7.

Adding and Subtracting Integers:

using
integer
tiles



$$3 + 2 = \square\square\square + \square\square = 5$$

Adding

$$3 + (-2) = \begin{array}{c} \square\square\square \\ + \square\square \\ \hline \end{array} = \begin{array}{c} \cancel{\square}\cancel{\square}\square \\ \cancel{\square}\cancel{\square} \\ \hline \end{array} = 1$$

cancel
out

$$-3 + 2 = \begin{array}{c} \square\square\square \\ \square\square \\ \hline \end{array}$$

$$= \begin{array}{c} \cancel{\square}\cancel{\square}\square \\ \cancel{\square}\cancel{\square} \\ \hline \end{array} = -1$$

$$-3 + (-2) = \begin{array}{c} \square\square\square \\ \square\square \\ \hline \end{array} = -5$$

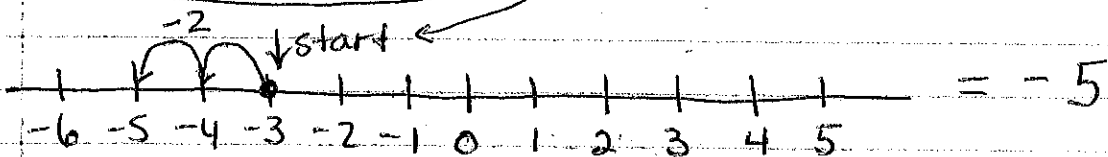
Subtracting

$$3 - 2 = \square\square\square - \square\square$$

cancel (remove 2)

$$= \square = 1$$

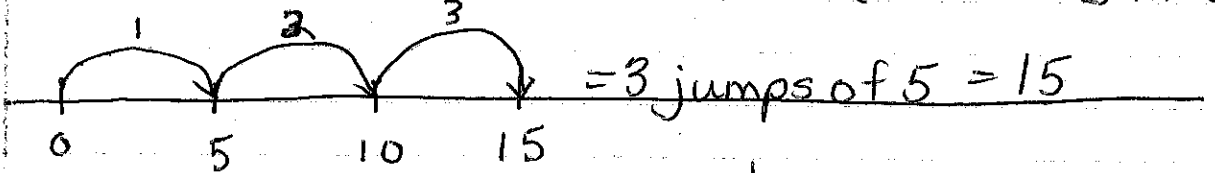
Number line: $-3 - 2$



2.1 Using Models to Multiply Integers

number line

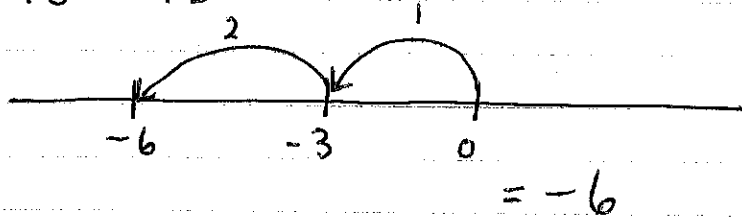
$$3 \times 5 = 3 + 3 + 3 + 3 + 3 \text{ (add 3 - 5 times)}$$



1 negative

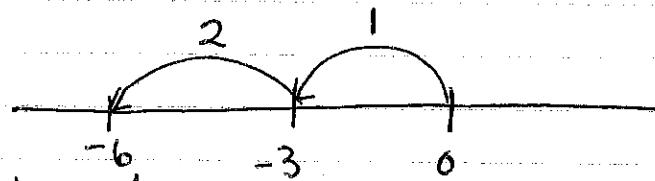
$$(-2) \times 3$$

↑
go backward
by 3's



$$2 \times (-3)$$

↑
2 jumps backwards
by 3

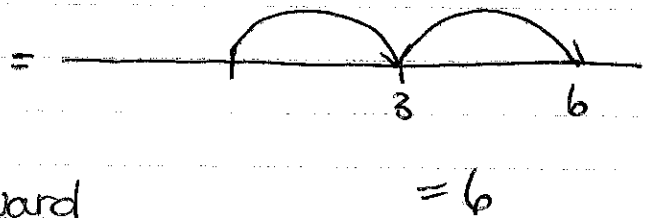


2 negatives

$$(-2) \times (-3)$$

backward backwards

↔ = go forward
(2 negatives cancel each other out!)



Integer tiles

$$+2 \times (-3) =$$

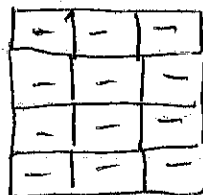
↑
2 groups of
neg. 3



neg 2nd

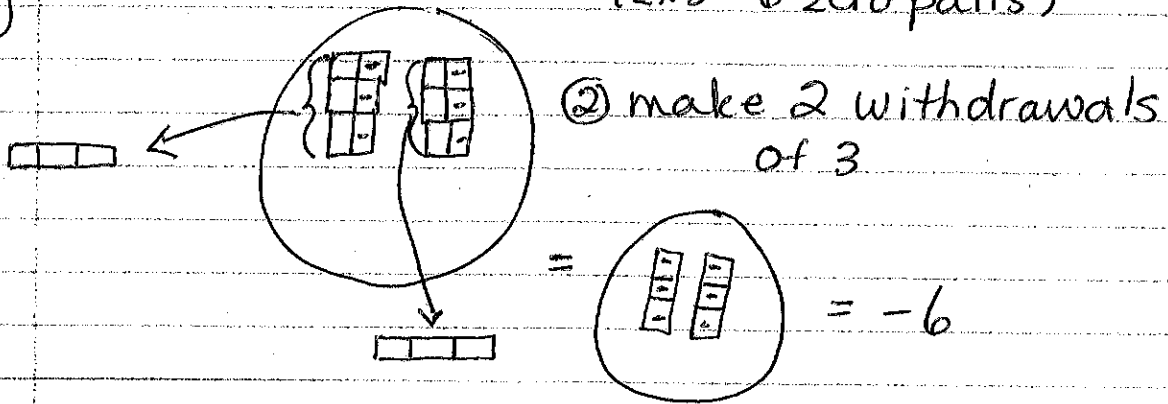
$$4 \times (-3)$$

↑
4 groups of
neg. 3

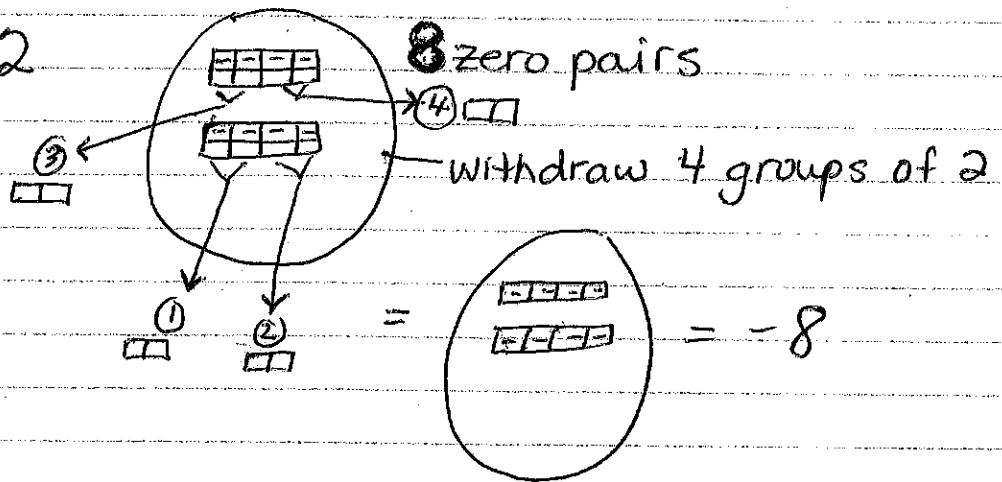


neg
1st

$$(-2) \times 3 = \textcircled{1} \text{ start with zero pairs } (2 \times 3 = 6 \text{ zero pairs})$$



$$(-4) \times 2$$



2.2 Developing Rules to Multiply Integers

Multiply by zero \Rightarrow Any number \times zero = zero

Multiply by one \Rightarrow Any number \times one = itself

Commutative Property: order doesn't matter in multiplication

$$2 \times 3 = 3 \times 2$$

$$6 \times 4 = 4 \times 6$$

Distributive Property:

$$3 \times (4 + 5) = 3 \times 4 + 3 \times 5$$

+/- Rules in Multiplication

$$+ \times + = +$$

$$+ \times - = -$$

$$- \times + = -$$

$$- \times - = +$$

} negative always wins

.....
← except when it goes against another negative \rightarrow turns positive.

ex

$$2 \times 2 = +4$$

$$-2 \times 2 = -4$$

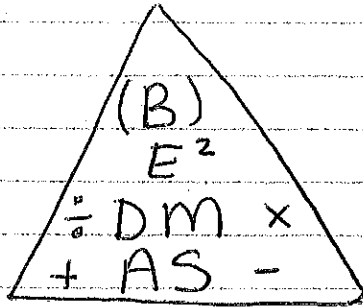
$$2 \times -2 = -4$$

$$-2 \times -2 = +4$$

2.4 * Same rules for division!

$$\frac{-36}{4} = -36 \div 4 = -9$$

2.5 Order of Operations w Integers



BEDMAS
1st → last

Brackets
Exponents
Division
Multiplication
Addition
Subtraction

ex $[(-6) + (-2)] \div (-4) + (-5)$

do inside the brackets 1st $[(-6) + (-2)] = -8$

$(-8) \div (-4) + (-5)$

divide next $(-8) \div (-4) = 2$

add $2 + (-5) = -3$

ex 2 * when written as a fraction;
assume brackets on top & bottom

means divide $\rightarrow \frac{2 + 4 \times (-8)}{-6} = \frac{(2 + 4 \times (-8))}{(-6)} = \frac{(2 + 4 \times (-8)) \div (-6)}{(-6)}$

brackets 1st
in brackets
multiplication 1st

$= (2 + (-32)) \div (-6)$
 $= (-30) \div (-6) = 5$