2.3 Using Models to Divide Integers

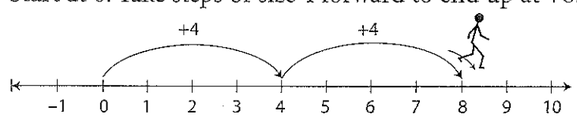
Quick Review

At Home / At School

Division is the inverse of multiplication.
So, $10 \div 5 = ?$ is the same as $? \times 5 = 10$.
The product means, "how many sets of 5 produce 10?"

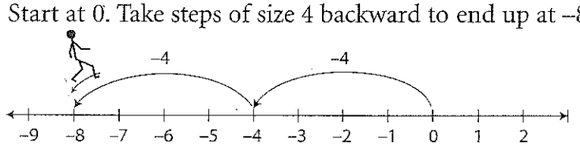
You can "walk" a number line to model the division of two integers.
If the step size is positive, walk forward. If the step size is negative, walk backward.
The number of steps is the quotient and the direction you are facing at the end determines its sign.

➤ **Positive ÷ Positive**
Divide: $(+8) \div (+4)$
Start at 0. Take steps of size 4 forward to end up at +8.



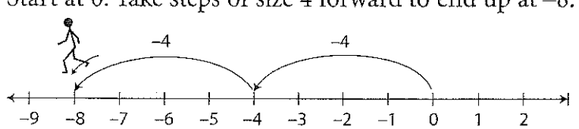
You took 2 steps and are facing the positive end of the line. So, $(+8) \div (+4) = +2$

➤ **Negative ÷ Negative:**
Divide: $(-8) \div (-4)$
Start at 0. Take steps of size 4 backward to end up at –8.



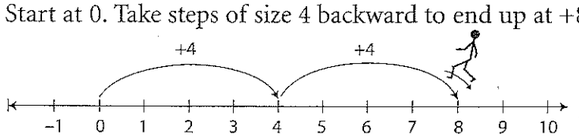
You took 2 steps and are facing the positive end of the line. So, $(-8) \div (-4) = +2$.

➤ **Negative ÷ Positive:**
Divide: $(-8) \div (+4)$
Start at 0. Take steps of size 4 forward to end up at –8.



You took 2 steps and are facing the negative end of the line. So, $(-8) \div (+4) = -2$.

➤ **Positive ÷ Negative:**
Divide: $(+8) \div (-4)$
Start at 0. Take steps of size 4 backward to end up at +8.



You took 2 steps. You are facing the negative end of the line. So, $(-8) \div (+4) = -2$.

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Review

Name _____ F L
Blk _____

Multi-digit Multiplication

49×72

old school

$$\begin{array}{r} 49 \\ \times\ 72 \\ \hline 98 \\ 3430 \\ \hline \boxed{3528} \end{array}$$

Box

	40	9
70	2800 +	630
2	80 +	18

$$\begin{array}{r} 3430 \\ +\ 98 \\ \hline \boxed{3528} \end{array}$$

Sieve

	4	9
7	2 / 8	6 / 3
2	0 / 8	1 / 8
	3 5	2 8

New

Same Rules for Division as Multiplication

1) do 2 numerals at a time
2) decide sign
3) do math (dont worry about sign)
* 4) double check sign *

+ +	⊕	
– –		
– +	⊖	
+ –		

Ex 1 Find the quotient (answer when you divide)

1) ✓
2) ✓
3) ✓
4) ✓

$9 \div 3$: ++ ⊕ $\quad 3\overline{)9}$ $\quad \boxed{+3}$

$-9 \div (-3)$: – – ⊕ $\quad 3\overline{)9}$ $\quad \boxed{+3}$

$9 \div (-3)$: + – ⊖ $\quad 3\overline{)9}$ $\quad \boxed{-3}$

Ex 2: The 1850 km Iditarod dogsled race last from 10 to 17 days. One night the temp. fell 2° each hour for a total change of −12°C. How long did it take for the temp. to drop?

1) Find the ? How long for temp. to drop?
2) math words: fell = decrease (− or ÷)
3) ~~decide math~~: drop
total change: 12°
fell 2° each hour
3) decide math: $-12 \div (-2)$ −−|⊕
$= {}^{+}6$
4) answer in ~~word~~ words! $\boxed{\text{It took 6 hrs for temp. to drop.}}$

Ex 3: Find the quotient $(-12) \div (+4)$

1) 2 #'s ✓
2) sign −+|⊖
3) math $12 \div 4 = 3$
4) sign $\boxed{-3}$

HW:

A	B	C
8, 9	10, 11	12, 13