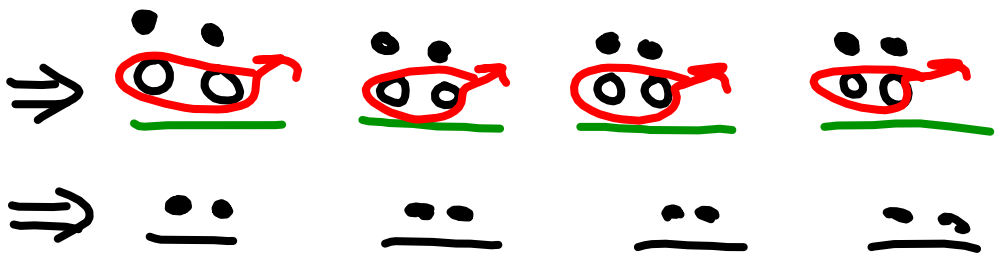
Warm Up Grade 8

○ = -

● = +

1) Use tile to model the product of (-4) x (-2) = (+ 8)

Remove 4 groups of 2 unshaded



2) Find the product using the distributive property Box Method

a) (-21) x (+46) = (− 966)

	20	1
40	800	40
6	120	6

800
120
40
+ 6
966

b) (-40) x (-34) = (+ 1360)

	30	4
40	1200	160

1200
+ 160
1360

Second number + is facing destination

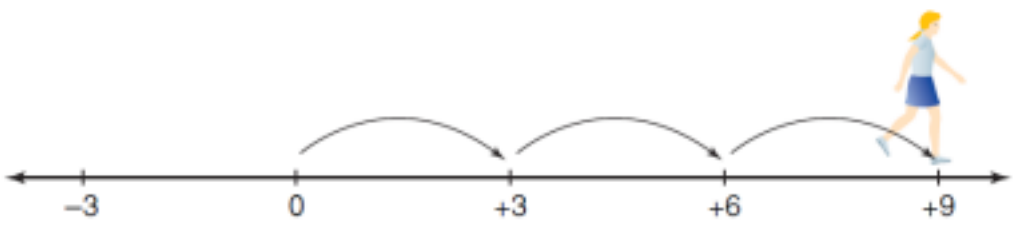
- Not facing destination

Divide: (+9) ÷ (+3)

We need to find how many steps of +3 make +9.

The step size, +3, is positive; so, walk forward.

Start at 0. Take steps forward to end up at +9.



We took 3 steps. We are facing the positive end of the line.

So, (+9) ÷ (+3) = +3

(?) x (+3) = (+9)

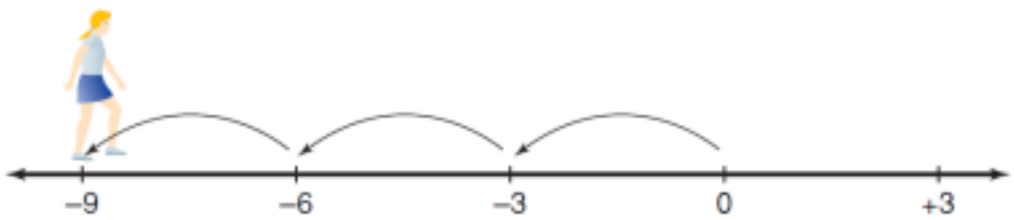
(+3)

Divide: (–9) ÷ (–3)

We need to find how many steps of –3 make –9.

The step size, –3, is negative; so, walk backward.

Start at 0. Take steps backward to end up at –9.



We took 3 steps. We are facing the positive end of the line.

So, (–9) ÷ (–3) = +3

(?) x (-3) = (-9)

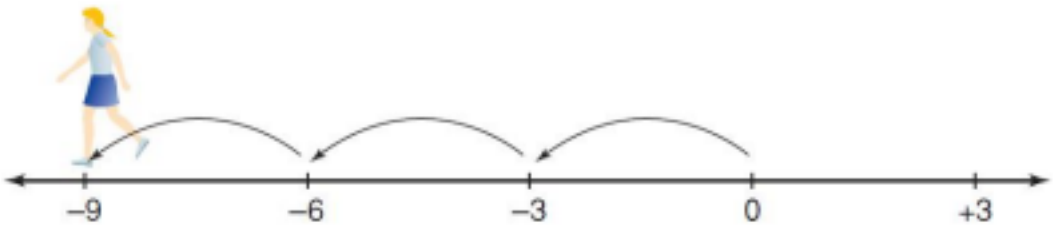
(–9) ÷ (–3) = (+3)

Divide: (–9) ÷ (+3)

We need to find how many steps of +3 take us to –9.

The step size, +3, is positive; so, walk forward.

Start at 0. To end up at –9, we took 3 steps forward.



We are facing the negative end of the line.

So, (–9) ÷ (+3) = –3

(?) x (+3) = (-9)

Recall Modeling Integer Multiplication

Using Number Lines

(+) x (-) = (-)

(-) x (+) = (-)

(+) x (+)

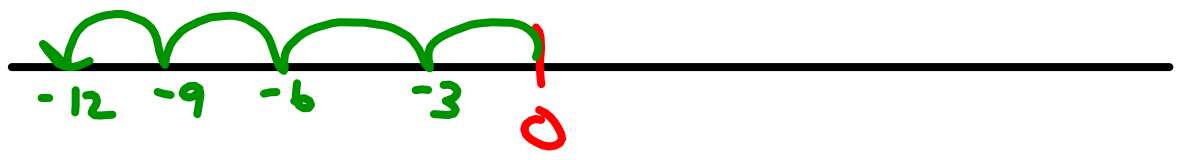
(Arrow size) X (# of jumps or arrows) = (STOP)

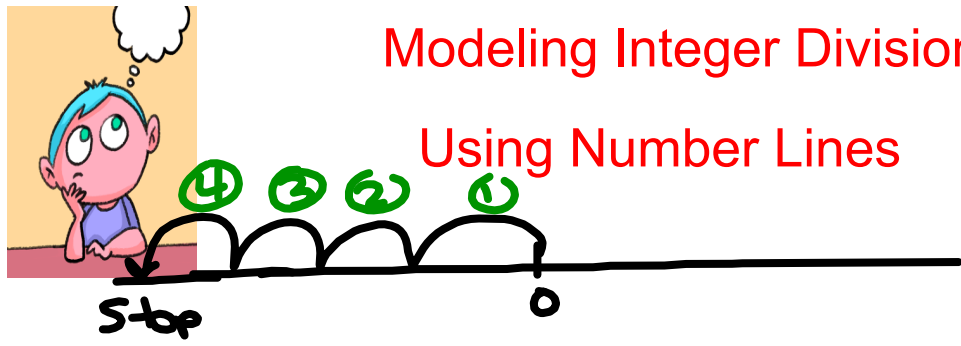
Always +

Due to the <u>commutative law</u> you can change the order of multiplication

Ex) Model (-3) x (+4) = (+4) x (-3)

4 jumps of -3





Modeling Integer Division

Using Number Lines

(+) x (-) = (-)

(-) x (+) = (-)

(+) x (+) = (+)

(STOP) ÷ (# of jumps or arrows) = (Arrow size)
Always +

OR

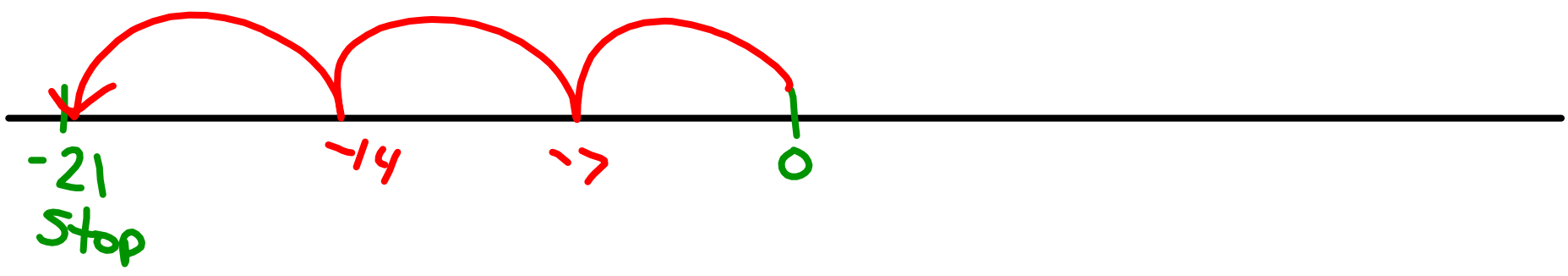
(STOP) ÷ (Arrow size) = (# of jumps or arrows)
Always +

Diff ⇒ −

Same ⇒ +

Model the following with a number line

(-21) ÷ (+3) = -7



reverse of multiplication

Dividing Integers

(+7) x (+4) = (+28) so we also know that (+28) ÷ (+7) =(+4)

(+28) ÷ (+4) = (+7)

(+5) x (-8) = (-40) so we also know that (- 40) ÷ (-8) = (+5)
and (-40) ÷ (+5) = (-8)

(-9) x (+ 3) = (-27) so we also know that (-27) ÷ (+3) = (-9)
and (-27) ÷ (-9) = (+3)

(-6) x (-2) = (+12) so we also know that (+12) ÷ (-6) = (-2)
and (+12) ÷ (-2) = (-6)

From the above information, what can you determine about

(a) a positive divided by a positive?
the answer will always be positive

(+)÷(+) = (+)

(b) a positive divided by a negative?
The answer will always be negative

(+)÷(-) = (-)

(c) a negative divided by a positive?
The answer will always be negative

(-)÷(+) = (-)

(d) a negative divided by a negative?
The answer will always be positive.

(-)÷(-) = (+)

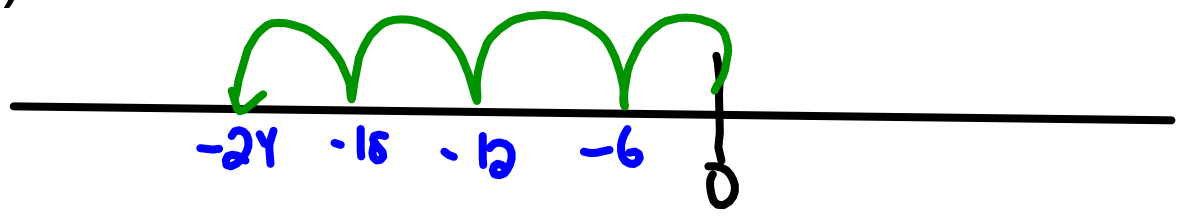
Quotient is the number that results from the division of one number by another.

24 ÷ 3 = 8 ← quotient

Rethink to multiplying if struggling

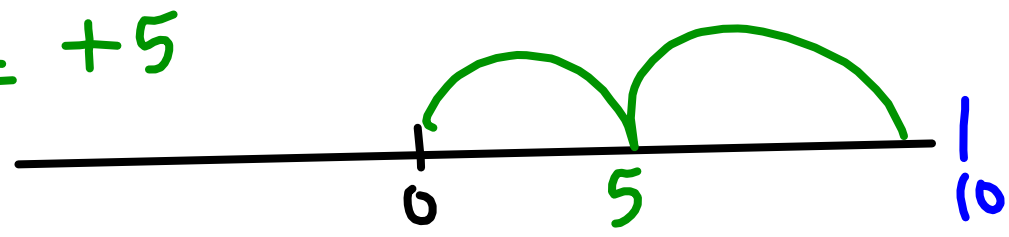
Sign #arrows

(-24) ÷ (+4) = (-6)



Then Draw number line

b) (+10) ÷ (+2) = +5



Divide the following using rules:

a) (-72) ÷ (+8)

(-9)

b) (-45) ÷ (-9)

(+5)

c) (+24) ÷ (+2)

(+12)

Class/Homework

page 80 - 81

#3(a,d)

#4(a,b,c)

#5

#6(a,b,c,d)

#7a(i), b(i) } NO MODELLING

#8(abcde) } Just Use Rules

Page 74-75

#9, #11, #13, #18

ex) (-12) ÷ (+2) = (-6) → (-6) x (+2) = (-12)

(+2) x (-6) = (-12)

3. Write a related multiplication equation for each division equation.

a) $(+25) \div (+5) = +5$ **b)** $(+24) \div (-2) = -12$ **c)** $(-14) \div (-7) = +2$ **d)** $(-18) \div (+6) = -3$

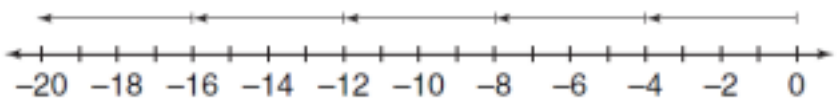
(STOP) ÷ (Arrow size) = (# of jumps or arrows) Always +

OR

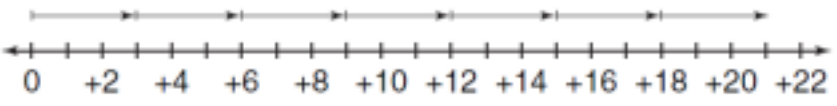
(STOP) ÷ (# of jumps or arrows) = (Arrow size) Always +

4. Which integer division does each number line represent? Find each quotient.

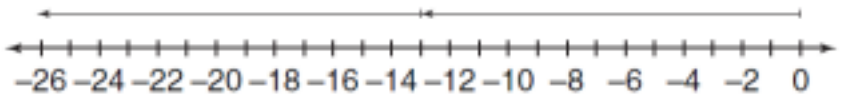
a)



b)



c)



(STOP) ÷ (# of jumps or arrows) = (Arrow size) Always +

OR (STOP) ÷ (Arrow size) = (# of jumps or arrows) Always +

5. Enrico walked a number line to model a division. He started at 0. Enrico took steps forward of size 4. He ended up at –24. Which division did Enrico model? How did you find out?

6. Use a number line. Find each quotient.

a) (+8) ÷ (+1) **b)** (–6) ÷ (–2)

c) (–16) ÷ (+8) **d)** (–3) ÷ (–1)

e) (+15) ÷ (–3) **f)** (–20) ÷ (+2)

Write a division statement for the following and answer

Ex) 10 yellow grouped in sets of 2 --> (+10) ÷ (+2) = (+5)

7. **a)** How many sets?

i) 12 yellow tiles grouped in sets of 6

ii) 15 red tiles grouped in sets of 3

b) How many in each set?

i) 8 yellow tiles shared among 2 sets

iii) 21 red tiles shared among 7 sets

8. Use Rules to find the Quotient (No Modeling)

a) $(+18) \div (+6)$ | **b)** $(-18) \div (+9)$ | **c)** $(-16) \div (-4)$ | **d)** $(+21) \div (-7)$ | **e)** $(+15) \div (-5)$ | **f)** $(-16) \div (-8)$

9.Use Rules to find the Quotient (No Modeling)

a) $(+8) \div (+4)$ **b)** $(-8) \div (-4)$ **c)** $(+8) \div (-4)$ **d)** $(-8) \div (+4)$

Write a divsion equation for each word problem

11. The temperature rose 3°C each hour for a total change of +12°C. Use integers to find the number of hours the change in temperature took.

13. A submarine was at the surface of the ocean. It made 4 identical plunges in a row. Its final depth was 148 m below sea level. What was the depth of each plunge?

Show your thinking

18. **Take It Further** Reena deposits $4 into her savings account each week. Today, Reena's account has a balance of $16.

a) How many weeks from now will Reena's account have a balance of $40?

b) What was the balance in Reena's account 2 weeks ago?

Explain how you can use integers to model each situation.