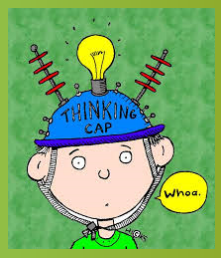
1) (-6) + (+9)
2) 90 - 11
3) ½ Of 50
4) 9 000 ÷ 1000
5) 36 ÷ 9
6) 14 X 0.5
7) 121 X 2
8) What number is divisible by 3? a) 93 b) 103 c) 95
9) What number is divisible by 4? a) 214 b)216 c)118
10) 1/3 of 12

$\frac{1}{3}$ of 6

6 ÷ 3 = 2

$\frac{1}{3}$ of 9

9 ÷ 3



$12 \div 3 \quad \frac{1}{3} \times \frac{12}{1} = \frac{12}{3} = 4$

Bang! ☺ Ques

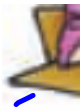
7. a) Use coloured tiles to subtract each pair of integers.

i) (+3) − (+1) and (+1) − (+3)

ii) (−3) − (−2) and (−2) − (−3)

iii) (+4) − (−3) and (−3) − (+4)

b) What do you notice about each pair of questions in part a?



☺

I noticed that the differences are opposite when you reverse the order of the integers.

i) (+3) − (+1) = +2

(+1) − (+3) = −2

ii) (−3) − (−2) = −1

(−2) − (−3) = +1

Reflect

Here are 4 types of subtraction questions:

- (negative integer) − (negative integer)
- (negative integer) − (positive integer)
- (positive integer) − (positive integer)
- (positive integer) − (negative integer)

Write a question for each type of subtraction.
Show how you use tiles to solve each question.

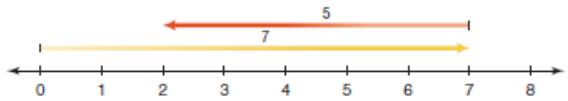
2.5 Subtracting Integers on a Number Line

Focus Subtract integers using number lines.

Recall how to model the subtraction of whole numbers with coloured tiles.

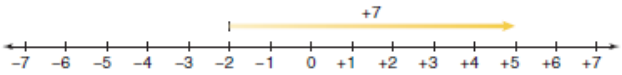
$7 - 5 = 2$

We can model this subtraction on a number line.



Subtraction is finding the difference. This number line shows how much more 7 is than 5.

➤ We can do the same to subtract two integers.
For example, to subtract: (+5) − (−2)
Think: "What do we add to −2 to get +5?"



We add +7 to −2 to get +5; so, (+5) − (−2) = +7
We also know that (+5) + (+2) = +7.
We can look at other subtraction equations and related addition equations.

(+9) − (+4) = +5 (+9) + (−4) = +5
(−9) − (−4) = −5 (−9) + (+4) = −5
(−9) − (+4) = −13 (−9) + (−4) = −13
(+9) − (−4) = +13 (+9) + (+4) = +13

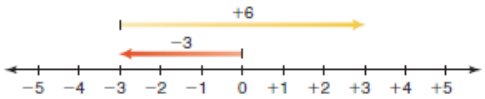
In each case, the result of subtracting an integer is the same as adding the opposite integer.

For example,

$(-9) - (+4) = -13$ $(-9) + (-4) = -13$

Subtract $+4$. Add -4.

➤ To subtract an integer, we add the opposite integer.
For example, to subtract: (−3) − (−6)
Add the opposite: (−3) + (+6)



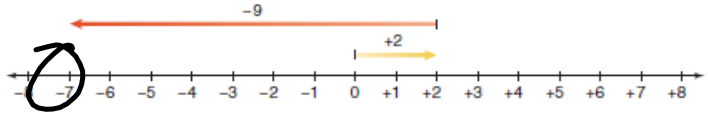
So, (−3) − (−6) = +3

(-3) -(-6)

(-3)+(+6)=+3

A Solution

a) To subtract: (+2) − (+9)
Add the opposite: (+2) + (−9)
Use a number line.
(+2) + (−9) = −7

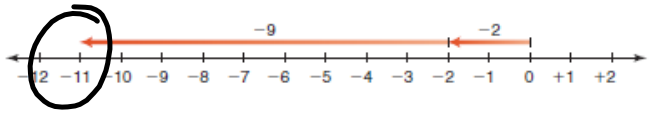


Another Strategy
We could use coloured tiles.

(+2) − (+9)

(+2) + (−9)

b) To subtract: $(-2) - (+9)$
Add the opposite: $(-2) + (-9)$
Use a number line.
$(-2) + (-9) = -11$



$(-2) - (+9)$
$(-2) + (-9)$

"XIdgs"Ok

Practice

1. Use ~~a number line~~ to subtract.
Use coloured tiles to check your answers.
a) (+2) − (+1) b) (+4) − (−3) c) (−4) − (−1)
d) (−5) − (+2) e) (−2) − (−6) f) (−3) − (−7)

your choice

2. a) Reverse the order of the integers in question 1, then subtract.
b) How are the answers different from those in question 1? Explain.

2a) (+1) − (+2) (+1) + (−2) = −1

3. Use a number line to subtract. Write the subtraction equations.
a) (+10) − (+5) b) (+7) − (−3) c) (−8) − (+6)
d) (−10) − (+5) e) (−4) − (+4) f) (−4) − (−4)

4. Rewrite using addition to find each difference.
a) (+6) − (+4) b) (−5) − (+4) c) (−2) − (−3)
d) (+4) − (−2) e) (+1) − (+1) f) (+1) − (−1)

5. What is the difference in temperatures?
How can you subtract to find out?
a) A temperature 7°C above zero and a temperature 5°C below zero
b) A temperature 15°C below zero and a temperature 8°C below zero
c) A temperature 4°C below zero and a temperature 9°C above zero

a) (+2) − (+1)

(+2) + (−1) ...

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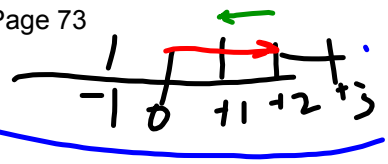
1a)



b) (+4) − (−3)

(+4) + (+3) = 7

c) (−4) − (−1)

(−4) + (+1) = −3

2a) (+1) − (+2)

(+1) + (−2)

7. **a)** The table shows the average afternoon temperatures in January and April for four Canadian cities.
What is the rise in temperature from January to April for each city? Show your work.

b) Which city has the greatest difference in temperatures?
How do you know?

	City	January Temperature	April Temperature
i)	Calgary	−4°C	+13°C
ii)	Iqaluit	−22°C	−10°C
iii)	Toronto	−3°C	+12°C
iv)	Victoria	+7°C	+13°C

8. **Assessment Focus**

a) Subtract: $(-6) - (+11)$

b) Suppose we subtract the integers in the opposite order: $(+11) - (-6)$
How does the answer compare with the answer in part a?
Use number lines to explain.

c) How is $(+6) - (-11)$ different from $(-6) - (+11)$? Explain.

11. **Take It Further** Copy each integer pattern.
Write the next 4 terms.
What is the pattern rule?

a) $+6, +2, -2, \ldots$ **b)** $-3, -1, +1, \ldots$
c) $+5, +12, +19, \ldots$ **d)** $+1, 0, -1, \ldots$

Use a number line to see the pattern