Student Name

Mathematics Stage 4

COMPUTATION WITH INTEGERS

Book 1 Compare and order integers

Version: 260207

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CONTENTS

OVERVIEW

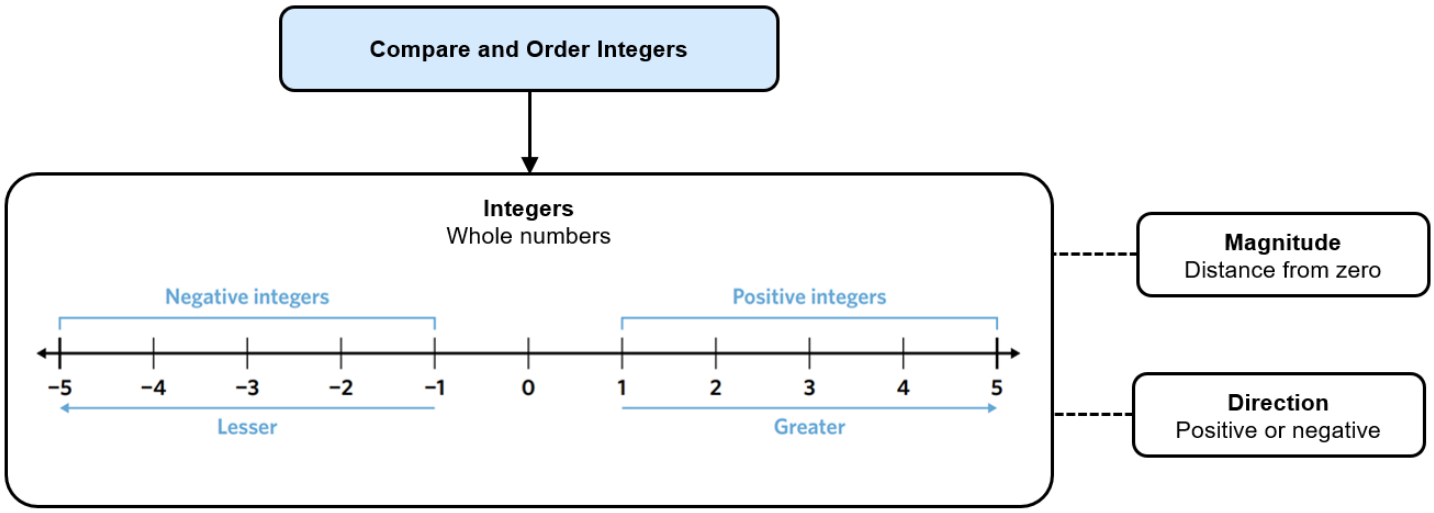
SYLLABUS CONTENT

MA4-INT-C-01 compares, orders and calculates with integers to solve problems

Compare and order integers

- Recognise and describe the direction and magnitude of integers
- Identify and represent integers on a number line
- Compare the relative value of integers using the less than (<) and greater than (>) symbols
- Order integers

SUMMARY



REVIEW OF PRIOR KNOWLEDGE

1 Circle the calculations below that will have an answer less than zero.

2 – 8	3 – 5	1200 – 500	140 – 165	11 – 63	16.67 – 13.45

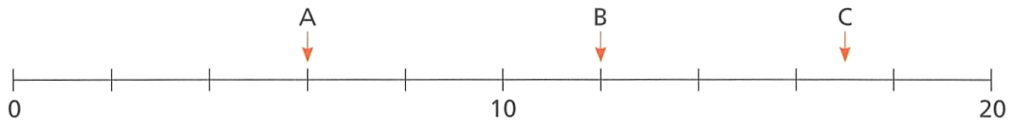
2 Starting at 10, count down by 2s until you get to -10

10, ……, ……, ……, ……, ……, ……, ……, ……, ……, ……

3 Starting at 30, count down by 5s until you get to -10

……

4 What numbers are the arrows pointing to?



5 Circle the greater number in each pair.

a 13 or 30 **b** 220 or 190 **c** 103 or 57 **d** 4000 or 999

6 Use the words equal to, greater than, or less than to complete the statements, then write a statement using $<$ or $>$

a 42 is …… 24 42 …… 24

b 39 is …… 99 39 …… 99

c 1000 is …… 900 1000 …… 900

d 21 …… 50 21 …… 50

7 Arrange these numbers in ascending order.

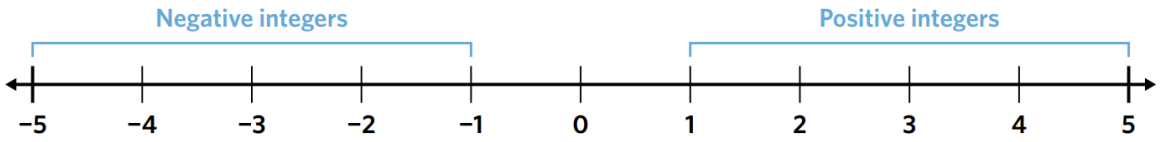
a 17, 7, 72 **b** 105, 95, 100

c 91, 19, 109 **d** 1500, 1005, 150

REPRESENTING INTEGERS ON A NUMBER LINE

INTEGERS

- An **integer** is a whole number.
- **Positive** numbers are greater than zero.
- **Negative** numbers are less than zero.



MAGNITUDE AND DIRECTION

- Integers have **magnitude** and **direction**.
- **Magnitude** is the distance from zero.
- **Direction** is positive or negative.

Example Identify the magnitude and direction of integers.

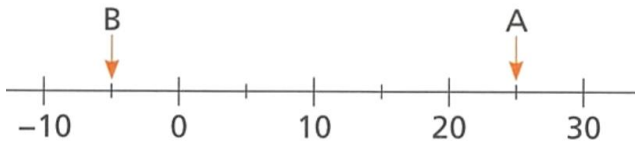
Integer	Magnitude	Direction
4		
3		
-3		
$+3$		
-5		
16		
-21		
-38		
$+38$		
	18	Positive
	83	Negative
	57	Negative
	412	Positive

INTEGERS ON A NUMBER LINE

- We can represent integers on a number line.
- If a number is to the **left of zero**, it is a **negative** integer.
- If a number is to the **right of zero**, it is a **positive** integer.

Example Identify integers on a number line.

What numbers are the arrows pointing to?



B: -5 A: 25

How much does each interval on the number line represent? How do you know?

2 intervals represent ……., so

1 interval represents ……

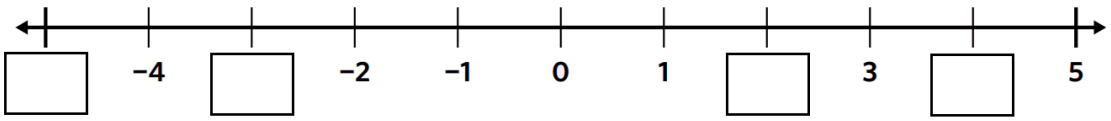
How do you know whether a number is positive or negative?

A number is negative if it is …… of zero.

A number is positive if it is …… of zero.

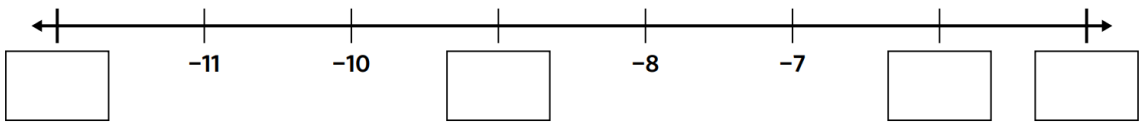
Complete the number lines.

a



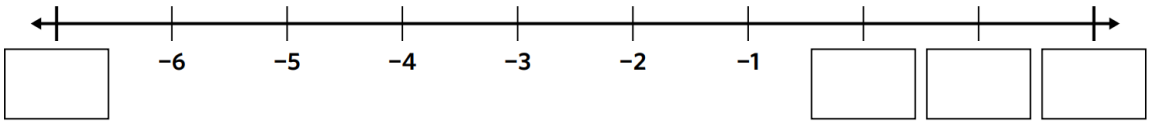
−5, −3, 2, 4

b



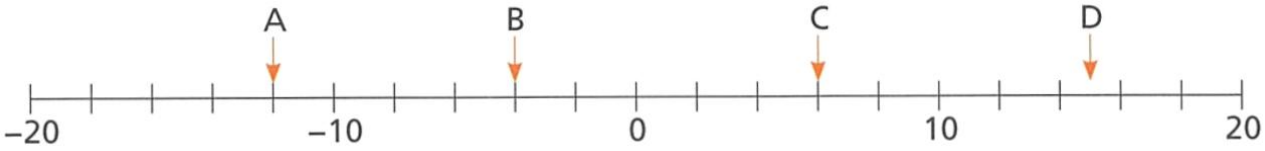
−12, −9, −6, −5

c



−7, 0, 1, 2

What numbers are the arrows pointing to?



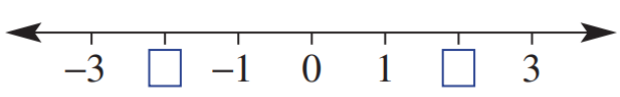
A: -12, B: -4, C: 6, D: 15

Key ideas

1. Integers are …… numbers.
2. Integers have two properties: …… and ……
3. Magnitude is the …… from zero, and direction is whether the number is …… or …… of zero.
4. Positive integers are to the …… of zero.
5. Negative integers are to the …… of zero.

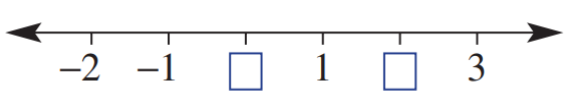
1 Find the missing number on the number line.

a



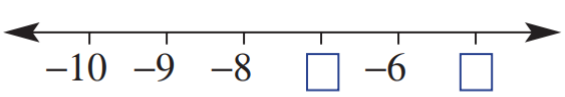
−2,2

b



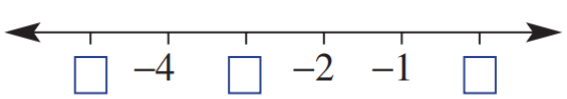
0, 2

c



−7, −5

d



−5, −3,0

2 Write an integer that represents these scenarios:

a The temperature today is 7 degrees below zero.

−7

b The carpark is 4 floors below ground.

−4

c The penthouse is on the 10th floor.

10

d Mount Everest is 8849 m above sea level.

8849

e The Dead Sea is 422 m below sea level.

−422

f The share market dropped 3 points.

−3

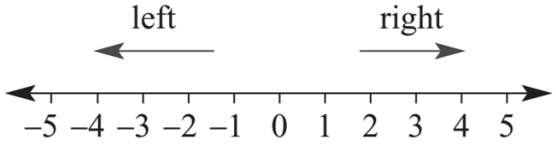
g James received $5 for doing the laundry.

5

h Chloe borrowed $30 from her mother.

−30

3 Add the word right or left to make the following statements true. Use this number line to help.



a 2 is to the _____ of 0

Right

b 1 is to the _____ of 3

Left

c −1 is to the _____ of 2

Left

d −4 is to the _____ of −5

Right

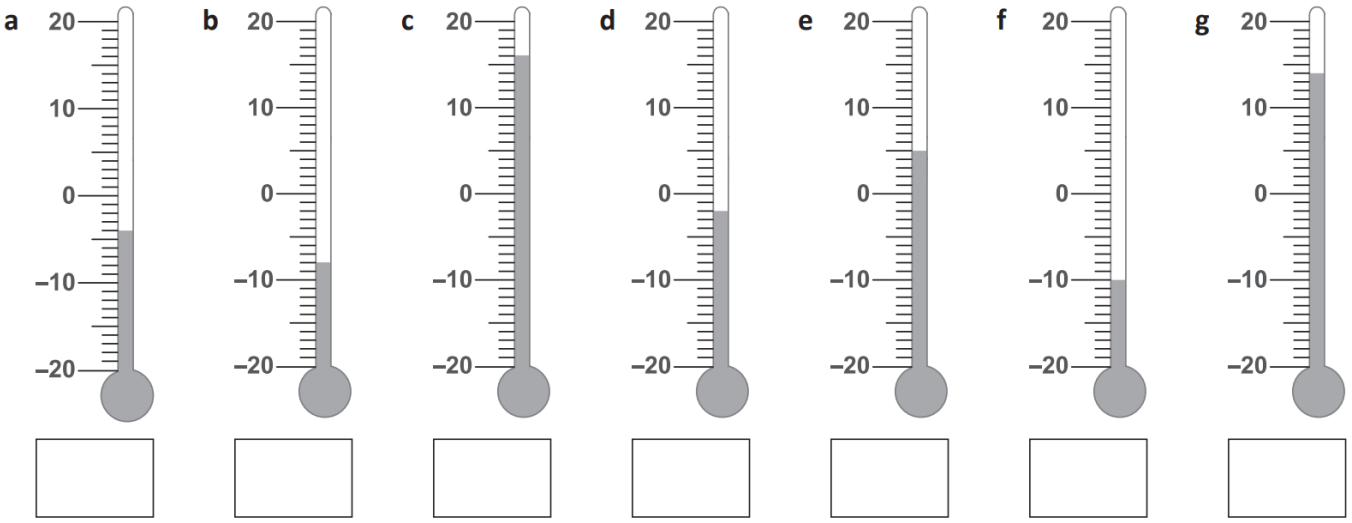
e −4 is to the _____ of −1

Left

f 2 is to the _____ of −4

Right

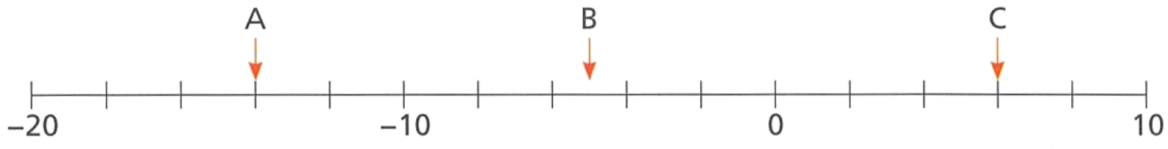
4 What is the temperature showing on each thermometer?



−4 −8 16 −2 5 −10 14

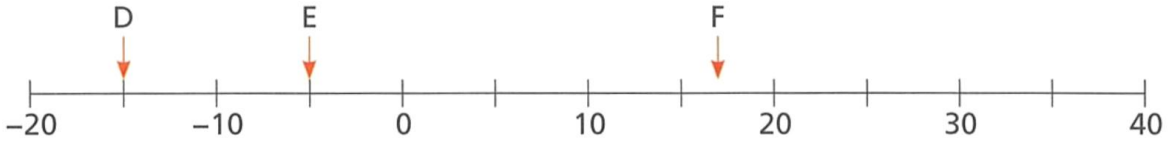
5 What numbers are the arrows pointing to?

a



A: −14, B: −5, C: 6

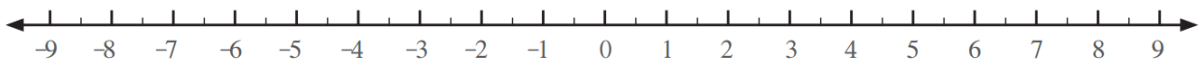
b



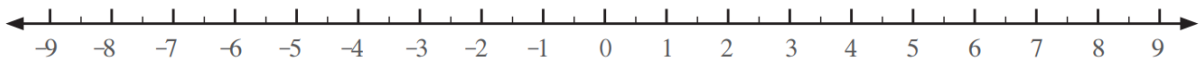
A: −15, B: −5, C: 17

6 Show these sets of numbers on a number line.

a $-5,\ 8,\ -1,\ 3,\ 6$



b $-8.5,\ 1.5,\ -2,\ 7.5,\ 5$



c $-4\frac{1}{2},\ 4,\ 6\frac{1}{2},\ -\frac{1}{2},\ 5$

7 Write all the integers counting up from -29 to -19

$-29,\ -28,$ .....

$-27, -26, -25, -24, -23, -22, -21, -20, -19$

8 Count down by 3s from 11 to -16

$11,\ 8,$ .....

$5, 2, -1, -4, -7, -10, -13, -16$

9 Count up by 7s from -32 to 17

$-32,\ -25,$ .....

$-18, -11, -4, 3, 10, 17$

10 Count down by 13s from 17 to -48

.....

$4, -9, -22, -35, -48$

11 Count up by 6s from -40 to 14

.....

$-40, -34, -28, -22, -16, -10, -4, 2, 8, 14$

12 Write the next three numbers in these simple patterns.

a 3, 2, 1, ___, ___, ___

0, −1, −2

b –8, –6, –4, ___, ___, ___

−2, 0 , 2

c 10, 5, 0, ___, ___, ___

−5, −10, −15

d –38, –40, –42, ___, ___, ___

−44, −46, −48

e –91, –87, –83, ___, ___, ___

−79, −75, −71

f 199, 99, –1, ___, ___, ___

−101, −201, −301

13 What number is halfway between:

a -2 and 6

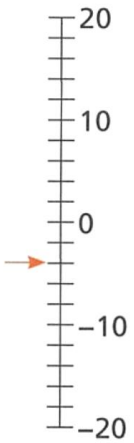
2

b -5 and 3

−1

14 Yasmin says that the arrow is pointing to -2. Explain why she is incorrect.

Each interval represents 2, so the arrow is pointing to −4



Draw arrows to these numbers:

a 6

b -6

c 12

d -13

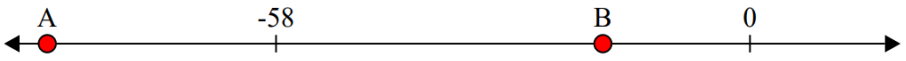
15 Decide which letter represents:

a -27 ..... 

B

b -16 ..... 

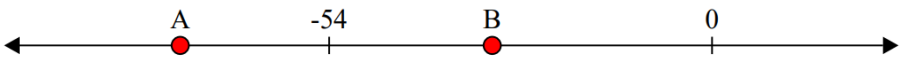
B

c -18 ..... 

B

d -91 ..... 

A

e -75 ..... 

A

f -10 ..... 

B

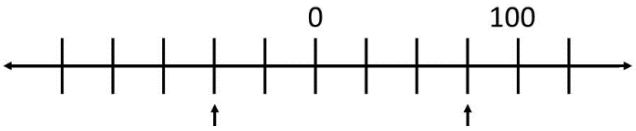
g -87 ..... 

A

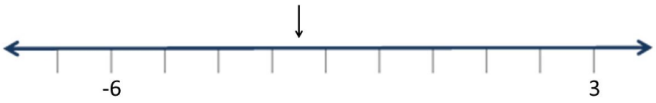
h -59 ..... 

B

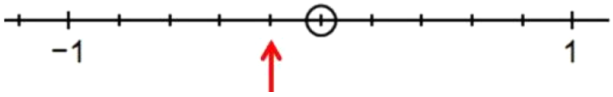
16 Determine the value(s) the arrow is pointing to.

a 

$-50, 75$

b 

-2.5

c 

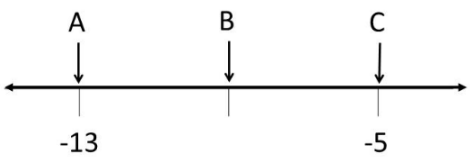
-0.2 or $-\frac{1}{5}$

d 

-24

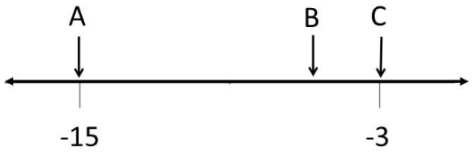
17

a The distance from A to B is the same as the distance from B to C. Find the value of B.



-9

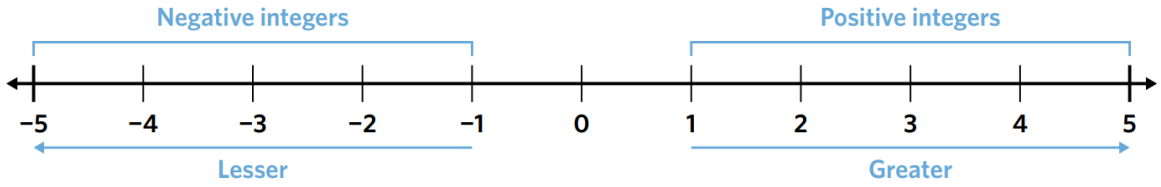
b The distance from A to B is three times the distance from B to C. Find the value of B.



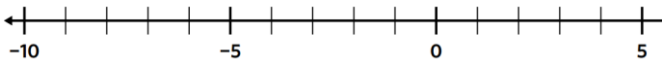
-6

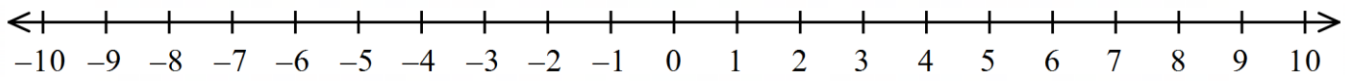
COMPARING AND ORDERING INTEGERS

- A number to the **left** is **smaller**.
- A number to the **right** is **larger**.



Example Compare integers using relational symbols.

Choose the correct relational symbol (<, >, =) to put in the box.	Label the positions of 2 and -8 on the number line.
$2 \boxed{>} -8$	 How did we know which number is larger? *The larger number is to the ..... on a number line*



a $6 \square 3$	**b** $-3 \square -6$	**c** $-3 \square 4$	**e** $4 \square -2$
>	>	<	>
d $-7 \square 6$	**e** $-17 \square -12$	**f** $-28 \square -31$	**f** $-24 \square -20$
<	<	>	<

Key ideas

1. A number is ..... than another number if it is to the right on the number line.
2. Negative numbers are always ..... than positive numbers.
3. A negative number with a larger magnitude is ..... than a negative number with a smaller magnitude, because it is further to the ..... on a number line.

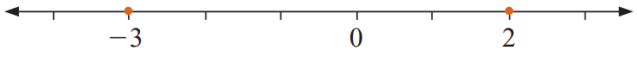
1 What numbers are the arrows pointing to?

Order the numbers from smallest to largest. ……

−9, −2, 4, 9

2 Use the number lines to compare these integers using the symbols > and <

a 2 …… −3



>

b −8 …… 3

<

c −3 …… −4

>>

d 2 …… 0

>

3 Complete the sentence by writing *greater than* or *less than*, then write using the > or < symbol.

a 3 is ……..... than 2 — Greater — $3 \square 2$ — >

b −4 is ……..... than 0 — Less — $-4 \square 0$ — <

c −7 is ……..... than −6 — Less — $-7 \square -6$ — <

d −9 is ……..... than −13 — Greater — $-9 \square -13$ — >

e 3 is ……..... than −3 — Greater — $3 \square -3$ — >

f −2 is ……..... than −147 — Greater — $-2 \square -147$ — >

4 Circle the body of water at the lowest altitude.

a −28 m Caspian Sea

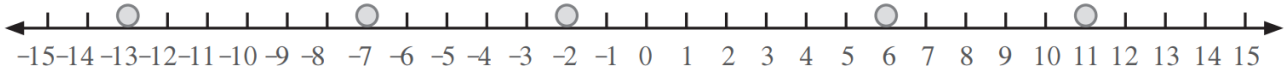
b −408 m Dead Sea

c −15 m Lake Eyre

B

5 List these numbers in ascending order.

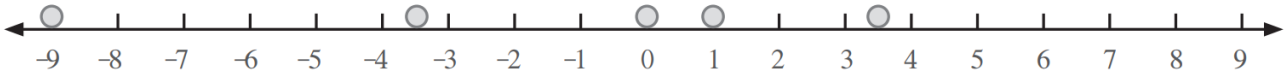
a



..... , ... , ... , ... , ...

−13, −7, −2, 6, 11

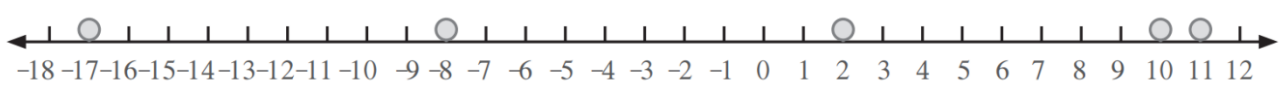
b



..... , ... , ... , ... , ...

−9, −3.5, 0, 1, 3.5

c



..... , ... , ... , ... , ...

−17, −8, 2, 10, 11

6 Compare these integers.

a	-3 ☐ 4 <	**b**	10 ☐ 5 >	**c**	16 ☐ -22 >	**d**	-25 ☐ -18 <
e	-3 ☐ 0 <	**f**	12 ☐ -4 >	**g**	-7 ☐ -23 >	**h**	15 ☐ -40 >
i	-60 ☐ -3 <	**j**	-10 ☐ 0 <	**k**	8 ☐ 6 >	**l**	3.5 ☐ -7 >
m	-12 ☐ -9 <	**n**	8 ☐ -45 >	**o**	-56 ☐ -9 <	**p**	0 ☐ -3 >

7 Arrange these numbers in ascending order (smallest to largest).

a −1, 8, −5, 2, −9, −4, 3 .....

−9, −5, −4, −1, 2, 3, 8

b 3, −5, 1, 0, −2, 4 .....

−5, −2, 0, 1, 3, 4

c −1, −7, −2, 5, −6, 1 .....

−7, −6, −3, −1, 0, 1, 5

d −3, −6, 0, 2, −10, 4, −1 .....

−10, −6, −3, −1, 0, 2, 4

e −30, 16, −12, −2, 1, 71, 0 .....

−30, −12, −2, 0, 1, 16, 71

f −11, −7, −6, −14, −8 .....

−14, −11, −8, −7, −6

8

City	Temperature
London	12°C
Moscow	−7°C
Sydney	32°C
Helsinki	−16°C
Toronto	−1°C

a Which city is the warmest?

Sydney

b Which city is the coldest?

Helsinki

c The temperature in Warsaw is warmer than Moscow but colder than Toronto. What is a possible temperature of Warsaw?

−6, −5, −4, −3, or − 2°C

9 Compare these integers.

a $6 \square 4$ >

b $3 \square -12$ >

c $-5 \square 4$ <

d $-11 \square -2$ <

e $8 \square -8$ >

f $-7\frac{1}{2} \square -7$ <

g $-\frac{1}{2} \square 0$ <

h $9\frac{1}{2} \square 9.9$ <

i $-5.1 \square -5.8$ >

10 An integer is greater than -65 and less than -58.

List all the possible integers in ascending order.

.....

−64, −63, −62, −61, −60, −59

11 Put these numbers in ascending order.

a $0.4, \quad -0.3, \quad -0.25, \quad 0.35, \quad 0.346$

.....

−0.3, −0.25, 0.346, 0.35, 0.4

b $197.5, \quad -109.4, \quad -129.6, \quad 14.5, \quad 88.9$

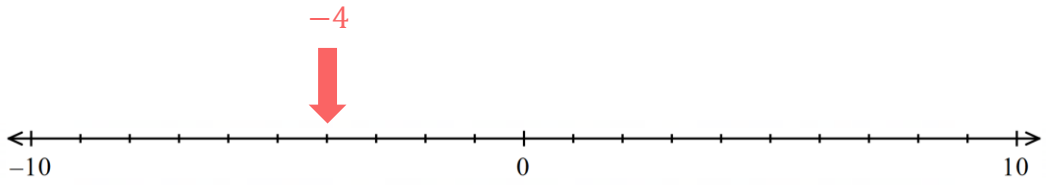
.....

−129.6, −109.4, 14.5, 88.9, 197.5

CHECK YOUR UNDERSTANDING

Integers on a number line

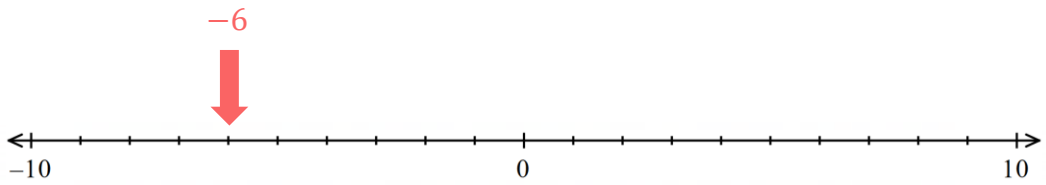
1 Here is a number line:



Which of the following numbers could be placed to the left of -4 on the number line?

a -3 **b** -7 **c** 3 **d** 7

2 Here is a number line:



Which of the following numbers could be placed to the left of -6 on the number line?

a 9 **b** -5 **c** 5 **d** -9

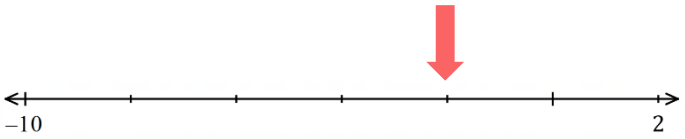
3 Which number is closest to zero?

a -5 **b** -4.8 **c** -4 **d** -5.2

4 Which number is furthest from zero?

a -5.78 **b** -6 **c** -5.8 **d** -6.1

5 What is the value indicated by the arrow?



a -14 **b** 0 **c** -2 **d** -6

Comparing integers

1 Which number is the greatest?

a -150 **b** -1 **c** -23 **d** 0

2 Which number is the smallest?

a 0 **b** -0.5 **c** -49 **d** -230

3 Which of these statements is true?

a $75 > 78$ **b** $-5 > -8$ **c** $-12 > -11$ **d** $7 < -9$

4 $\square > -45$ What value could go in the box to make the statement correct?

a -52 **b** -1 **c** -46 **d** -45

5 Order these numbers in ascending order (from smallest to greatest)

$$-5, -8, 7, -6$$

a $-5, -6, 7, -8$ **b** $-5, -6, -8, 7$ **c** $-8, -6, -5, 7$ **d** $7, -5, -6, -8$

6 Order these numbers in ascending order

-5 2 0 -9 8

a $8, 2, 0, -5, -9$ **b** $-5, 2, 0. -9, 8$ **c** $0, 2, -5, 8, -9$ **d** $-9, -5, 0, 2, 8$

7 Which list below has the numbers in descending order?

a $5, 2, 0, -3$ **b** $8, -6, -4, -1$ **c** $-2, 0, 1, 4$ **d** $-1, 2, 5, -7$