Tuesday

In a magic square the sum of each row, column and diagonal is the same.

−7	2	−1
4	−2	−8
−3	−6	3

Example

Row	$4 + -2 + -8 = -6$
Column	$2 + -2 + -6 = -6$
Diagonal	$3 + -2 + -7 = -6$

A

1

		11
	14	
17	6	

2

26		
32	17	20

3

25		
	18	
17		11

B

1

1		
−4	3	−2

2

		−5
		4
5		1

3

−1		
	−2	
−5		−3

C

1

1			2
−6	7	4	−7
	−5		
		3	−2

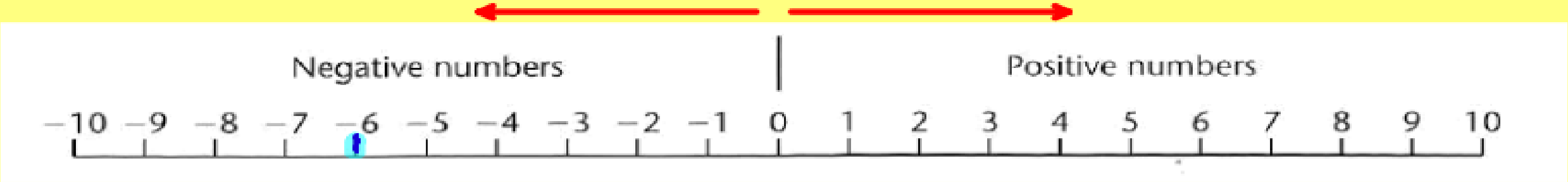
2

	3		8
9		2	
	1	5	
−5		0	7

3

4			3

L.O. Add and subtract negative numbers including temperatures.



$6 + 2 = 8$ $\quad -6 + 2 = -4$

$6 + (-2) = 4$ $\quad -6 + (-2) = -8$

$7 - 3 = 4$ $\quad -7 - 3 = -10$

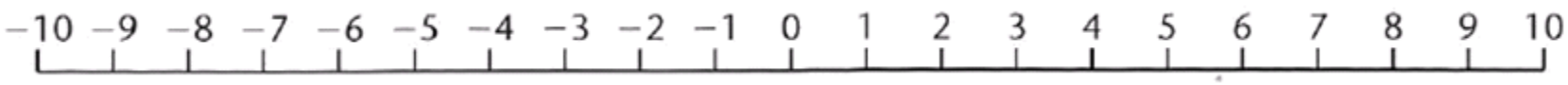
$7 - (-3) = 10$ $\quad -7 - (-3) = -4$

Adding a positive number results in a move along the number line to the right.

Adding a negative number results in a move along the number line to the left.

Subtracting a positive number results in a move along the number line to the left.

Subtracting a negative number results in a move along the number line to the right.



A

Copy and complete by writing the missing numbers in the boxes

1. −4 −3 −2 ☐ ☐ ☐ 2
2. 10 8 6 4 ☐ ☐ ☐
3. 12 8 ☐ ☐ ☐ −8 −12
4. 10 7 4 ☐ ☐ ☐ −8
5. −6 −4 −2 ☐ ☐ ☐ 6
6. 8 5 ☐ ☐ ☐ −7 −10
7. −13 −8 −3 ☐ ☐ ☐ 17
8. 10 ☐ ☐ ☐ −6 −10 −14
9. What temperatures are shown by the letters on the scale?
10. Which letter shows the coldest temperature?
11. Give the difference in temperature between:
    a) A and B b) A and C c) B and C.
12. What would the temperature be if it was:
    a) at A and fell 9°
    b) at C and rose 13°
    c) at B and fell 25°.
13. The temperature is −6°C and it rises by 10°C.
    What is the new temperature?
14. The temperature is −6°C and it falls by 10°C.
    What is the new temperature?

B

1. $3 + (-2)$
2. $5 - (-6)$
3. $-4 + (-9)$
4. $-2 - (-5)$
5. $-5 + 3$
6. $-6 - 5$
7. $4 + (-7)$
8. $-1 - (-1)$
9. $6 + (-3)$
10. $-1 + 8$
11. $-2 + (-5)$
12. $-3 - 7$
13. $7 - (-2)$
14. $1 + (-8)$
15. $-3 + (-6)$
16. $-4 - (-3)$
17. $-5 - (-10)$
18. $2 - (-7)$
19. $-2 + (-6)$
20. $-3 + 2$
21. $4 - (-3)$
22. $-1 - (-4)$
23. $3 + (-5)$
24. $-6 - 8$
25. $5 + (-5)$
26. $-3 - (-7)$
27. $1 - (-5)$
28. $-4 - 2$
29. $-1 + 9$
30. $-5 + (-1)$
31. $2 + (-2)$
32. $-4 - (-5)$

Copy and complete the tables showing changes in temperature.

33.

OLD	CHANGE	NEW
−3°C	+8°C	5°C
9°C	−10°C	
−5°C	−5°C	
−2°C	+12°C	
8°C	+6°C	
11°C	−15°C	

34.

OLD	CHANGE	NEW
8°C	−11°C	−3°C
	+14°C	−6°C
	−7°C	−1°C
	+16°C	13°C
	+9°C	1°C
	−12°C	−15°C

35.

OLD	CHANGE	NEW
−6°C		9°C
−2°C		−14°C
−13°C		7°C
5°C		−1°C
−9°C		−2°C
3°C		−11°C

C

Work out

1. $2 + (-6) + (-12)$
2. $-7 - 4 - (-3)$
3. $5 - (-3) + (-6)$
4. $-4 + (-8) - (-9)$
5. $3 - (-1) - (-5)$
6. $-2 + 3 + (-8)$
7. $6 + (-5) - (-3)$
8. $-5 + (-7) + (-4)$
9. $-3 - (-11) + (-14)$
10. $-9 + 4 - (-6)$
11. $-6 - 2 + (-7)$
12. $-1 - (-2) - (-5)$
13. $-8 + 10 - (-4)$
14. $-4 - (-1) + (-12)$
15. $1 - (-6) - (-3)$
16. $-10 + (-4) + (-7)$
17. $-2 - 2 - (-2)$
18. $7 + (-10) + (-6)$
19. $-5 + (-3) - (-14)$
20. $8 - (-5) + (-9)$
21. $-12 + 7 + (-8)$
22. $-6 - (-4) - (-5)$
23. $4 + (-8) - (-10)$
24. $-1 - 11 + (-7)$

25. The amount of money in a bank account is the balance. Banks often allow customers to have a negative balance. Copy and complete this table showing balances at the start and end of May.

BALANCE 1st May	CHANGE	BALANCE 31st May
−£300	+£50	−£250
−£120		£80
£70		−£190
£64	−£105	
−£20	−£90	
−£49	+£36	
£17	−£78	
	−£40	−£60
	+£57	−£81
	−£135	£429
	−£110	−£26

Negative Numbers Golf

- The golf course at Upingham has 18 holes.
- A good golfer would take 72 strokes for a round of 18 holes.
- This is called par.
- If a player takes 70 strokes, this is a score of -2 (or 2 under par).
- If a player takes 78 strokes, this is a score of 6 (or 6 over par).
- After three rounds of a golf tournament, these were the players' scores:

Name	Score
Anders	-9
Brown	-8
Cox	-8
Dobson	-4
Evans	0
Fielder	0
Green	1
Howard	1
Innes	4
Jones	6

- Draw a new table showing, for each player:
  1. The final score.
  2. The total number of strokes taken for all four rounds.

- The number of strokes taken on the fourth round were:

Name	Strokes
Anders	70
Brown	67
Cox	69
Dobson	71
Evans	71
Fielder	74
Green	70
Howard	72
Innes	74
Jones	70

- Dobson and Howard played against each other for one round.
- Their scores on each of the 18 holes were as follows:

Dobson	1	0	-2	3	0	-2	-1	0	1	1	-2	4	-1	0	1	-1	0	-2
Howard	0	1	-1	2	-1	-1	1	0	-1	2	-1	-1	1	0	2	-1	-1	1

- How many strokes did each of them take for that round?
- Which player won the most holes?

Goal Difference

- Goals For (GF) is the number of goals a team has scored against their opponents.
- Goals Against (GA) is the number of goals opponents have scored against a team.

Goal Difference

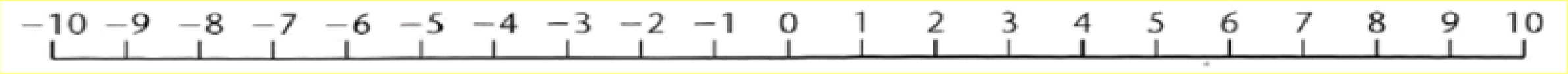
- If a team has scored 15 goals against their opponents and had 5 goals scored against them their goal difference = +10 (15 – 5 = 10).
- If a team has scored 15 goals against their opponents and had 23 goals scored against them their goal difference = -8 (15 – 23 = -8).
- The higher the goal difference, the better the team is performing.

- A team has a goal difference of -7.
- What could their goals for and goals against have been?
- Write down 10 possibilities:

Goals for	Goals against

- A team has a goal difference of -5. They win their next game with a score of 2-(
  What is their new goal difference?
- A team has a goal difference of -8. They win their next game with a score of 3-2
  What is their new goal difference?
- A team has a goal difference of -1. They win their next game 4-1.
  What is their new goal difference?
- A team has a goal difference of -2. They lose their next game 5-3.
  What is their new goal difference?

L.O. Add and subtract negative numbers including temperatures.



A submarine is submerging at a rate of 4m per second. How far below the surface is it after 5 seconds, 10 seconds and 20 seconds?

Tell me two temperatures that lie between 0 °C and -8 °C. Which is higher? How do you know? What is the difference between the higher temperature and -8 °C?

ANSWERS

Page 9

A

1

9	22	11
16	14	12
17	6	19

2

26	29	14
11	23	25
32	17	20

3

25	10	19
12	18	24
17	26	11

B

1

0	−5	2
1	−1	−3
−4	3	−2

2

−1	6	−5
−4	0	4
5	−6	1

3

−1	−6	1
0	−2	−4
−5	2	−3

C

1

1	−4	−1	2
−6	7	4	−7
6	−5	−8	5
−3	0	3	−2

2

−4	3	−1	8
9	−2	2	−3
6	1	5	−6
−5	4	0	7

3

4	−7	−10	3
−5	−2	1	−4
−1	−6	−3	0
−8	5	2	−9

Page 94

A

1 −4 −3 −2 −1 0 1 2
2 10 8 6 4 2 0 −2
3 12 8 4 0 −4 −8 −12
4 10 7 4 1 −2 −5 −8
5 −6 −4 −2 0 2 4 6
6 8 5 2 −1 −4 −7 −10
7 −13 −8 −3 2 7 12 17
8 10 6 2 −2 −6 −10 −14

9 A −2°C
B 18°C
C −14°C

10 C

11 a) 20°C
b) 12°C
c) 32°C

12 a) −11°C
b) −1°C
b) −7°C

13 4°C
14 −16°C

Page 95

B

1 1	**9** 3	**17** 5	**25** 0
2 11	**10** 7	**18** 9	**26** 4
3 −13	**11** −7	**19** −8	**27** 6
4 3	**12** −10	**20** −1	**28** −6
5 −2	**13** 9	**21** 7	**29** 8
6 −11	**14** −7	**22** 3	**30** −6
7 −3	**15** −9	**23** −2	**31** 0
8 0	**16** −1	**24** −14	**32** 1

33

OLD	CHANGE	NEW
−3°C	+8°C	5°C
9°C	−10°C	−1°C
−5°C	−5°C	−10°C
−2°C	+12°C	10°C
8°C	+6°C	14°C
11°C	−15°C	−4°C

34

OLD	CHANGE	NEW
8°C	−11°C	−3°C
−20°C	+14°C	−6°C
6°C	−7°C	−1°C
−3°C	+16°C	13°C
−8°C	+9°C	1°C
−3°C	−12°C	−15°C

35

OLD	CHANGE	NEW
−6°C	+15°C	9°C
−2°C	−12°C	−14°C
−13°C	+20°C	7°C
5°C	−6°C	−1°C
−9°C	+7°C	−2°C
3°C	−14°C	−11°C

C

1 −16	**7** 4	**13** 6	**19** 6
2 −8	**8** −16	**14** −15	**20** 4
3 2	**9** −6	**15** 10	**21** −13
4 −3	**10** 1	**16** −21	**22** 3
5 9	**11** −15	**17** −2	**23** 6
6 −7	**12** 6	**18** −9	**24** −19

25

BALANCE 1st May	CHANGE	BALANCE 31st May
−£300	+£50	−£250
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£70	−£260	−£190
£64	−£105	−£41
−£20	−£90	−£110
−£49	+£36	−£13
£17	−£78	−£61
−£20	−£40	−£60
−£138	+£57	−£81
£564	−£135	£429
£84	−£110	−£26