

DIRECTED NUMBERS, TORTURE SQUARES, ADDITION/SUBTRACTION KS3 Non-Calculator

Name: _____



Using number patterns or otherwise, complete the following:

A: ADDITION

+	4	3	2	1	0	-1	-2	-3	-4
4	8	7	6	5	4	3	2	1	0
3		6		4					-1
2		5							
1		4							
0		3							
-1		2							
-2		1							
-3		0							
-4		-1					-6	-7	-8

B: Having completed the torture square, write down the answer to each of the following:

- | | |
|-----------------------|------------------------|
| 1. $4 + (-3) =$ _____ | 5. $-3 + (-4) =$ _____ |
| 2. $-3 + 4 =$ _____ | 6. $-4 + (-3) =$ _____ |
| 3. $2 + (-4) =$ _____ | 7. $-2 + (-3) =$ _____ |
| 4. $-4 + 2 =$ _____ | 8. $-4 + (-1) =$ _____ |
| 9. $-4 + 4 =$ _____ | 10. $0 + (-3) =$ _____ |

11. What do you notice? Write down a rule for adding negative and positive numbers.



12. Apply this rule to get the answer to:

- (a) $-4 + 7 =$ _____ (m) $-1 + (-1) + 2 =$ _____
(b) $4 + (-7) =$ _____ (n) $12 + (-15) =$ _____
(c) $-5 + 3 =$ _____ (o) $-12 + (-8) =$ _____
(d) $-5 + (-3) =$ _____ (p) $-12 + 9 =$ _____
(e) $-6 + 6 =$ _____ (q) $9 + (-12) =$ _____
(f) $6 + (-6) =$ _____ (r) $-9 + (-8) =$ _____
(g) $-8 + (-2) =$ _____ (s) $-8 + 15 =$ _____
(h) $-8 + 2 =$ _____ (t) $9 + (-5) + (-4) =$ _____
(i) $-9 + (-9) =$ _____ (u) $1 + (-2) + 3 + (-4) =$ _____
(j) $-9 + 5 =$ _____ (v) $8 + (-9) + 10 + (-7) =$ _____
(k) $-9 + (-3) =$ _____ (w) $-8 + (-9) + 7 + (-6) =$ _____
(l) $-3 + (-2) + (-5) =$ _____ (x) $-6 + (-8) + 6 + 8 =$ _____
(y) $0 + (-8) + (-5) + 13 =$ _____
(z) $-23 + (-27) + 50 =$ _____

13. $-1.5 + 2 =$ _____ 14. $-3.5 + (-0.5) =$ _____ 15. $-2.1 + (-3.4) =$ _____

Using number patterns or otherwise, complete the following:



SUBTRACTION

C:

-	6	5	4	3	2	1	0	-1	-2	-3	-4
6	0	1	2	3							
5		0	1	2	3						
4			0	1	2	3					
3				0	1	2	3				
2					0	1	2				
1						0					
0							0				
-1											
-2											
-3											
-4											0

D: Having completed the torture square, write down the answer to each of the following:

1. $4 - (-3) = \underline{\hspace{2cm}}$

5. $-3 - (-4) = \underline{\hspace{2cm}}$

2. $-3 - 4 = \underline{\hspace{2cm}}$

6. $-4 - (-3) = \underline{\hspace{2cm}}$

3. $0 - 4 = \underline{\hspace{2cm}}$

7. $-2 - (-3) = \underline{\hspace{2cm}}$

4. $-4 - (-1) = \underline{\hspace{2cm}}$

8. $-4 - (-1) = \underline{\hspace{2cm}}$

9. $-4 - 4 = \underline{\hspace{2cm}}$

10. $0 - (-3) = \underline{\hspace{2cm}}$

11. What do you notice? Write down a rule for subtracting negative and positive numbers.



12. Apply this rule to get the answer to:

- (a) $-4 - 7 =$ _____ (m) $1 - (-1) - 2 =$ _____
(b) $4 - 7 =$ _____ (n) $12 - (-15) =$ _____
(c) $-5 - 3 =$ _____ (o) $-12 - (-8) =$ _____
(d) $-5 - (-5) =$ _____ (p) $-12 - 9 =$ _____
(e) $-6 - 6 =$ _____ (q) $9 - 12 =$ _____
(f) $-6 - (-6) =$ _____ (r) $-9 - 8 =$ _____
(g) $-8 - (-2) =$ _____ (s) $-8 - 15 =$ _____
(h) $-8 - 2 =$ _____ (t) $-9 - (-5) - (-4) =$ _____
(i) $-9 - (-9) =$ _____ (u) $1 - (-2) - (-3) - 6 =$ _____
(j) $-9 - 5 =$ _____ (v) $-8 - (-9) - 10 - (-7) =$ _____
(k) $-9 - (-3) =$ _____ (w) $-8 - (-9) - 7 - (-6) =$ _____
(l) $-3 - (-2) - (-5) =$ _____ (x) $6 - (-8) - 6 - 8 =$ _____
(y) $0 - 8 - 6 - (-8) =$ _____
(z) $9 - 15 - 8 - (-14) =$ _____

13. $-1.5 - 2 =$ _____ 14. $-3.5 - (-0.5) =$ _____ 15. $-2.1 - (-3.4) =$ _____

PRACTICE:



Complete the following:

E: ADDITION

+	- 4	-3	- 9	- 10	12	-15	18	-23	14
10	6	7	1	0					
-9		-12							
8		5							
-7									
6									
-5									
4									
-12									
-15							3		-1
-50									

F: SUBTRACTION

-	- 4	-3	- 9	- 10	12	-15	18	-23	14
10	14	13	19	20					
-9		-6	0						
8		11							
-7									
6									
-5									
4									
-12									
-15							-33		-29
-50	-46								

MIXED EXERCISE



G: Write down the answer to each of the following:

1. $-5 - 8 + 13 = \underline{\hspace{2cm}}$

2. $5 - (-8) - 8 = \underline{\hspace{2cm}}$

3. $-5 - 8 + (-8) = \underline{\hspace{2cm}}$

4. $-25 - 5 - (-5) = \underline{\hspace{2cm}}$

5. $-17 + 8 - 5 = \underline{\hspace{2cm}}$

6. $-17 + 8 - (-17) = \underline{\hspace{2cm}}$

7. $-19 - (-8) + (-9) = \underline{\hspace{2cm}}$

8. $-9 - (-9) = \underline{\hspace{2cm}}$

9. $0 - 15 - (-3) + (-3) = \underline{\hspace{2cm}}$

10. $-15 - 3 - 5 - 7 = \underline{\hspace{2cm}}$

11. $5 - 9 - 5 + 9 - 10 + (-10) = \underline{\hspace{2cm}}$

12. $1 + 2 + 3 + 4 + 5 - 1 - 2 - 3 - 4 - 5 = \underline{\hspace{2cm}}$

13. $0 + (-12) - (-15) - (-12) + (-15) = \underline{\hspace{2cm}}$

14. $-99 + (-1) - (-100) - 10 = \underline{\hspace{2cm}}$

Optional: 15. $3x - 5x = \underline{\hspace{2cm}}$ 16. $-2x + 2x = \underline{\hspace{2cm}}$ 17. $-2x - 3x = \underline{\hspace{2cm}}$

18. $-3x - 5x + x = \underline{\hspace{2cm}}$ 19. $-15x - (-7x) = \underline{\hspace{2cm}}$ 20. $-8x + (-3x) = \underline{\hspace{2cm}}$

H: What is the answer to:

$1 - 2 + 3 - 4 + 5 - 6 + 7 - 8 + 9 - 10 + \dots$ up to $+99 - 100 - (-50)$

Can you see a quick way of doing this?