

Name _____

Date _____

1.1 Adding and subtracting integers — worked answers

Add and subtract with positive and negative integers. · 57 questions

A · Fluency — Straight calculations. Build speed and accuracy.

1 $-8 + 5 =$

Answer: -3

Think of a number line. $-8 + 5$ lands on -3 .

2 $-3 + 9 =$

Answer: 6

Think of a number line. $-3 + 9$ lands on 6.

3 $6 + (-9) =$

Answer: -3

Think of a number line. $6 + (-9)$ lands on -3 .

4 $12 + (-4) =$

Answer: 8

Think of a number line. $12 + (-4)$ lands on 8.

5 $-7 + 7 =$

Answer: 0

Think of a number line. $-7 + 7$ lands on 0.

6 $-15 + 6 =$

Answer: -9

Think of a number line. $-15 + 6$ lands on -9 .

7 $4 + (-11) =$

Answer: -7

Think of a number line. $4 + (-11)$ lands on -7 .

8 $-2 + (-6) =$

Answer: -8

Think of a number line. $-2 + (-6)$ lands on -8 .

9 $-7 - 4 =$

Answer: -11

Subtracting moves you left: $-7 - 4 = -11$.

10 $3 - 8 =$

Answer: -5

Subtracting moves you left: $3 - 8 = -5$.

11 $-10 - 5 =$

Answer: -15

Subtracting moves you left: $-10 - 5 = -15$.

12 $6 - 13 =$

Answer: -7

Subtracting moves you left: $6 - 13 = -7$.

13 $-1 - 9 =$

Answer: -10

Subtracting moves you left: $-1 - 9 = -10$.

14 $20 - 35 =$

Answer: -15

Subtracting moves you left: $20 - 35 = -15$.

15 $-12 - (-5) =$

Answer: -7

Subtracting a negative is the same as adding: $-12 - (-5) = -12 + 5 = -7$.

16 $4 - (-6) =$

Answer: 10

Subtracting a negative is the same as adding: $4 - (-6) = 4 + 6 = 10$.

17 $-3 - (-3) =$

Answer: 0

Subtracting a negative is the same as adding: $-3 - (-3) = -3 + 3 = 0$.

18 $-8 - (-10) =$

Answer: 2

Subtracting a negative is the same as adding: $-8 - (-10) = -8 + 10 = 2$.

19 $7 - (-7) =$

Answer: 14

Subtracting a negative is the same as adding: $7 - (-7) = 7 + 7 = 14$.

20 $-20 - (-25) =$

Answer: 5

Subtracting a negative is the same as adding: $-20 - (-25) = -20 + 25 = 5$.

21 $-5 + 8 - 12 =$

Answer: -9

Work left to right: $-5 + 8 - 12 = -9$.

22 $-20 - (-7) - 3 =$

Answer: -16

Work left to right: $-20 - (-7) - 3 = -16$.

23 $9 - 15 + 4 =$

Answer: -2

Work left to right: $9 - 15 + 4 = -2$.

24 $-6 + (-4) - (-10) =$

Answer: 0

Work left to right: $-6 + (-4) - (-10) = 0$.

25 $14 - 20 - 6 =$

Answer: -12

Work left to right: $14 - 20 - 6 = -12$.

B · Reasoning — Missing numbers, pyramids and explanations.

26 Find the missing number: $-9 + ? = 4$

Answer: 13

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

27 Find the missing number: $? - (-6) = -2$

Answer: -8

$? = -2 + (-6) = -8$.

28 Find the missing number: $6 + ? = -4$

Answer: -10

$? = -4 - 6 = -10$.

29 Find the missing number: $? + (-7) = -15$

Answer: -8

$? = -15 + 7 = -8$.

30 Two integers add up to -4 . One of them is 5. What is the other?

Answer: -9

Other = $-4 - 5 = -9$.

31 Two integers add up to -4 . One of them is -11 . What is the other?

Answer: 7

Other = $-4 - (-11) = -4 + 11 = 7$.

32 In this addition pyramid each brick is the sum of the two below it. Bottom row: 3, -5 , 1. What number is at the top?

Answer: -6

Middle row: $3 + (-5) = -2$ and $-5 + 1 = -4$. Top = $-2 + (-4) = -6$.

33 Addition pyramid — bottom row 2, -4 , -6 . Find the top number.

Answer: -12

Middle: -2 and -10 . Top = $-2 + (-10) = -12$.

34 In an addition table, the entry for row 3 and column -4 is $3 + (-4)$. What is it?

Answer: -1

$3 + (-4) = -1$.

35 Which calculation gives the largest answer?

- ☐ $-3 + 8$
- ☐ $-3 - 8$
- ☐ $3 - 8$
- ☐ $-8 - (-3)$

Answer: $-3 + 8$

The four answers are 5, -11 , -5 and -5 , so $-3 + 8 = 5$ is largest.

36 Sofia says: “ $-6 - (-9)$ is negative because it starts with a negative.” Is she right?

- ☐ Yes
- ☐ No

Answer: No

$-6 - (-9) = -6 + 9 = 3$, which is positive. Subtracting a negative makes the answer bigger.

37 Put these in order, smallest first, separated by commas: $-3, 2, -7, 0, -1$

Answer: $-7, -3, -1, 0, 2$

On a number line the further left, the smaller: $-7 < -3 < -1 < 0 < 2$.

C · Challenge — Multi-step problems that stretch you.

38 Two integers have a sum of -2 and a difference of 10. What is the larger integer?

Answer: 4

Larger = $(\text{sum} + \text{difference}) \div 2 = (-2 + 10) \div 2 = 4$. (The smaller is -6 , and $4 + (-6) = -2$ ✓)

39 Two integers have a sum of -2 and a difference of 10. What is the smaller integer?

Answer: -6

Smaller = $(\text{sum} - \text{difference}) \div 2 = (-2 - 10) \div 2 = -6$.

40 Work out $(-4 + 7) - (-9 + 2)$.

Answer: 10

Brackets first: $3 - (-7) = 3 + 7 = 10$.

41 Work out $-3 - (-8 + 5) - 6$.

Answer: -6

Bracket: $-8 + 5 = -3$. So $-3 - (-3) - 6 = 0 - 6 = -6$.

42 $a + b = -5$ and $a = -12$. Work out b .

Answer: 7

$b = -5 - (-12) = -5 + 12 = 7$.

43 How many integers are there from -6 to 6 inclusive?

Answer: 13

From -6 to 6 is $6 - (-6) = 12$ steps, and you must add 1 for the starting number: 13 integers.

44 Start at -3 . Add 7, then subtract 12, then subtract -5 . What is the result?

Answer: -3

$-3 + 7 = 4$; $4 - 12 = -8$; $-8 + 5 = -3$.

45 What is the smallest possible value of $a - b$ if a and b are each chosen from $-5, -2, 3, 8$?

Answer: -13

To make $a - b$ as small as possible take the smallest a and the largest b : $-5 - 8 = -13$.

D · Word problems — Integers in real contexts.

- 46** At midnight the temperature is -7°C . By noon it has risen 12°C . What is the temperature at noon, in $^{\circ}\text{C}$?
Answer: 5
 $-7 + 12 = 5^{\circ}\text{C}$.
- 47** The temperature falls from 4°C to -9°C . By how many degrees did it fall?
Answer: 13
 $4 - (-9) = 13$, so it fell by 13°C .
- 48** A submarine is at -85 m . It descends a further 40 m . What is its new depth, in metres?
Answer: -125
 $-85 - 40 = -125\text{ m}$.
- 49** A diver at -18 m rises 25 m . She is now above the surface flying a drone. What is her height, in metres?
Answer: 7
 $-18 + 25 = 7\text{ m}$ above the surface.
- 50** Yuri's bank balance is $-\$45$. He pays in $\$70$. What is his new balance, in dollars?
Answer: 25
 $-45 + 70 = 25$, so the balance is $\$25$.
- 51** Zara's balance is $\$30$. She spends $\$52$. What is her new balance, in dollars?
Answer: -22
 $30 - 52 = -22$, so she is $\$22$ overdrawn.
- 52** A lift starts on floor -2 , goes up 7 floors, then down 3 floors. Which floor is it on?
Answer: 2
 $-2 + 7 - 3 = 2$.
- 53** The highest point in a country is $2\,350\text{ m}$ above sea level and the lowest is -180 m . What is the difference in height, in metres?
Answer: 2530
 $2350 - (-180) = 2350 + 180 = 2530\text{ m}$.
- 54** In golf, a score of -4 beats a score of $+1$. A player is on -4 and then scores $+6$ on the next hole. What is her total score?
Answer: 2
 $-4 + 6 = 2$.
- 55** The temperature in Astana is -14°C and in Cairo it is 21°C . How many degrees warmer is Cairo?
Answer: 35
 $21 - (-14) = 21 + 14 = 35^{\circ}\text{C}$ warmer.
- 56** A company made a profit of $\$120\,000$ in year 1, a loss of $\$185\,000$ in year 2 and a profit of $\$90\,000$ in year 3. What is the overall result, in dollars? (Use a negative number for a loss.)
Answer: 25000
 $120000 - 185000 + 90000 = 25000$, an overall profit of $\$25\,000$.

- 57** At 6 a.m. the temperature is -11°C . It rises 3°C every hour. At what time does it first reach 1°C ? Give the hour as a 24-hour number, e.g. 10 for 10 a.m.

Answer: 10

It must rise $1 - (-11) = 12^{\circ}\text{C}$. At 3°C per hour that takes $12 \div 3 = 4$ hours, so 6 a.m. + 4 h = 10 a.m.