



Positive & negative numbers

GRADE 6 MATH

Answer keys for the exit ticket, practice worksheet, and homework, plus notes for the lesson slides. Each answer shows the steps and the most likely wrong answer (“If wrong”), so you can tell what a mistake means, not just that it is one. Questions go from **fluency** to **application** to **reasoning**.

Exit Ticket — answer key

Use: End of the positive/negative lesson. 5–8 min, independent.

Timing: 5–8 min · independent. Item 4 is the zero-as-reference-point item — the concept students most often miss.

1. Deposit \$45, withdrawal \$30 as signed numbers? **FLUENCY**

Answer: **+45 and –30**

1. Money coming in is positive: +45.
2. Money going out is the opposite direction: –30.

If wrong: Wrote both as positive because ‘\$30 is still money.’ The sign records DIRECTION (in vs out), not whether the amount matters.

2. 120 m below sea level? **APPLICATION**

Answer: **–120 metres**

1. Sea level is the zero point.
2. Below sea level is the negative direction: –120 m.

If wrong: Wrote 120 — dropped the sign, losing the ‘below’ information entirely.

3. Opposite of –7? **APPLICATION**

Answer: **7 — the same distance from 0, on the other side**

1. –7 is 7 units to the left of zero.
2. Its opposite is 7 units to the RIGHT of zero: 7.
3. Opposites are equally far from 0 in opposite directions.

If wrong: Answered –7 (thought ‘opposite’ means ‘make it negative’) or 0.

4. +50 Monday, –80 Tuesday; total; meaning of \$0? REASONING

Answer: **+50 and –80; total –\$30; \$0 would mean breaking even — earnings and losses exactly cancelled**

1. Earned: +50. Lost: –80.
2. $50 + (-80) = -30$, so the shop is down \$30 over the two days.
3. A total of 0 does not mean ‘no money’ — it means the gains and losses balanced exactly (break-even).

If wrong: Said \$0 means the shop has no money at all. Zero is a REFERENCE POINT (break-even here), not an absence.

Quick answers for fast checking:

#	Level	Answer
1	fluency	+45, –30
2	application	–120 m
3	application	7
4	reasoning	–\$30; 0 = break-even

Practice Worksheet — answer key

Use: During the lesson after the mini-lesson/deck. Items 4 and 9 both probe what zero MEANS; item 8 previews absolute value (the “Absolute value” sheet (Grade 6)).

Timing: 15–25 min · pairs or independent · circulate on 7–9. Items 1–3 fluency, 4–6 application, 7–9 reasoning.

1. 8 degrees below zero? FLUENCY

Answer: **–8°**

1. Below zero is the negative direction.

If wrong: Wrote 8 — dropped the sign.

2. Gain of 15 yards? FLUENCY

Answer: **+15**

1. A gain moves forward: positive.

If wrong: Wrote –15 by assuming football yardage is usually negative.

3. 250 feet above sea level? FLUENCY

Answer: **+250**

1. Above sea level is the positive direction.

If wrong: Wrote -250 — reversed the direction.

4. Elevator down 3 from ground; what is 0? APPLICATION

Answer: **-3; 0 is the ground floor**

1. Down is negative: -3 .
2. Zero represents the ground floor — the agreed reference level, not ‘no floor.’

If wrong: Wrote 3, or said 0 means the elevator does not exist / is empty.

5. -2°C drops 6 more? APPLICATION

Answer: **-8°C**

1. Dropping means moving in the negative direction.
2. $-2 - 6 = -8^{\circ}\text{C}$.

If wrong: Answered $+4$ — subtracted toward zero instead of away from it. Dropping from a negative goes further below zero.

6. $-\$15$ then $+\$40$? APPLICATION

Answer: **$+\$25$**

1. $-15 + 40 = 25$.
2. The business is up $\$25$ overall.

If wrong: Answered -55 (added the magnitudes) or 55 (ignored the loss).

7. Opposite of 12, and opposite of that? REASONING

Answer: **-12 ; then 12 again**

1. The opposite of 12 is -12 (same distance, other side of 0).
2. The opposite of -12 is 12 — you are back where you started.
3. Taking the opposite twice returns the original number.

If wrong: Answered -12 for both, treating ‘opposite’ as ‘negative’ rather than ‘the reflection across 0.’

8. -30 m vs $+30$ m — who is farther from sea level? REASONING

Answer: **Neither — they are the same distance (30 m), just in opposite directions**

1. -30 is 30 m from zero; $+30$ is also 30 m from zero.
2. Distance from zero ignores direction.
3. One is below, one is above, but both are equally far.

If wrong: Said $+30$ is farther because it is the 'bigger' number. Distance from zero is not the same as which number is greater.

9. Maya: balance of 0 = no bank account? REASONING

Answer: **No — 0 is the break-even point, meaning the account exists and holds exactly nothing owed or held**

1. Zero here is a REFERENCE POINT on the money number line.
2. A balance of 0 means you owe nothing and have nothing — the account still exists.
3. 'No account' is not a number at all; 0 is a real, meaningful value.

If wrong: Treated 0 as 'absence of the thing' instead of a located point on a scale. Compare with 0°C , which is a real temperature, not 'no temperature.'

Quick answers for fast checking:

#	Level	Answer
1	fluency	-8°
2	fluency	$+15$
3	fluency	$+250$
4	application	-3 ; 0 = ground floor
5	application	-8°C
6	application	$+\$25$
7	reasoning	-12 , then 12
8	reasoning	Same distance
9	reasoning	0 is break-even

Homework — answer key

Use: Parallels the practice sheet one-to-one. Item 8 sets up absolute value in the next skill.

Timing: ~15 min at home · independent · review item 7 (what 0 means) as the next-day warm-up.

1. Loss of 20 points? **FLUENCY**

Answer: **-20**

1. A loss is the negative direction.

If wrong: Wrote 20 — dropped the sign.

2. 5 degrees above zero? **FLUENCY**

Answer: **+5**

1. Above zero is positive.

If wrong: Wrote -5.

3. Debt of \$75? **FLUENCY**

Answer: **-75**

1. Owing money is the negative direction.

If wrong: Wrote 75 — a debt is money in the opposite direction from money held.

4. -\$25 balance, deposit \$60? **APPLICATION**

Answer: **+\$35**

1. $-25 + 60 = 35$.
2. You clear the \$25 debt and have \$35 left.

If wrong: Answered -85 (added magnitudes) or 85.

5. 40 ft below surface; what is 0? **APPLICATION**

Answer: **-40 ft; 0 is the water surface**

1. Below is negative: -40 ft.
2. Zero represents the surface of the water — the reference level.

If wrong: Wrote 40, or said 0 means 'no water.'

6. Opposite of -9 ? APPLICATION

Answer: **9 — same distance from 0, other side**

1. -9 sits 9 units left of zero.
2. Its opposite sits 9 units right of zero: 9.

If wrong: Answered -9 — treated ‘opposite’ as ‘negative.’

7. -18 then $+18$ yards? REASONING

Answer: **0 — the team is exactly back where it started**

1. $-18 + 18 = 0$.
2. Zero does not mean ‘no yards ever gained’; it means the losses and gains exactly cancel.
3. The team is back at its starting line.

If wrong: Said 0 means the team has no yards or did not play. Zero is the balance point.

8. -12°C vs $+12^{\circ}\text{C}$ — farther from freezing? REASONING

Answer: **Neither — both are 12 degrees from freezing, in opposite directions**

1. Freezing is 0°C , the reference point.
2. -12 is 12 below; $+12$ is 12 above.
3. Same distance from zero, opposite directions.

If wrong: Chose $+12$ because it is the greater number. Distance from zero is separate from which number is greater.

Quick answers for fast checking:

#	Level	Answer
1	fluency	-20
2	fluency	$+5$
3	fluency	-75
4	application	$+\$35$
5	application	-40 ft; 0 = surface
6	application	9
7	reasoning	0 = back to start
8	reasoning	Same distance

Lesson slides — teaching notes & timing

Mini-lesson deck: ~12–15 min, then launch into the practice sheet. Slide numbers match the deck.

Slide	~Time	Note
1/8	0:00	Frame the skill: signed numbers describe real situations; zero is meaningful.
2/8	1:00	Hook — do NOT resolve. Most students say 0 means ‘nothing.’ Let that sit; it is the misconception the lesson corrects.
3/8	3:00	Name both ideas: sign = direction, zero = agreed reference point. Resolve the hook here — 0°C is a real temperature, not the absence of temperature.
4/8	5:00	WE1 — money. Break-even is the clearest example of a meaningful zero.
5/8	7:00	WE2 — opposites as reflection across 0. Ask for the opposite of the opposite; the round trip makes the idea stick.
6/8	9:00	CFU — all-student response. Answer -120 m. Watch for a dropped sign.
7/8	11:00	Separate ‘distance from zero’ from ‘which is greater.’ This previews absolute value and prevents the $-8 > -3$ error in the ordering lesson.
8/8	13:00	Launch the in-class practice sheet.