

SCAVENGER HUNT



MEDIANS AND THE CENTROID

Which Piece of the Median Is Longer?

Three medians on every card · long piece, short piece, whole · the cards check the answers

FREE

ANSWER

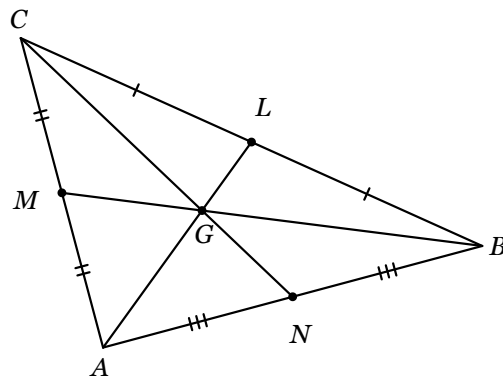
19

L, M and N are midpoints. The medians meet at G.

$GL = 9$

How long is AG?

The piece at the corner is long. The piece at the midpoint is short.



G

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1. **Tape the 16 cards around the room**, in any order. Each card has a large letter in its bottom left corner. Start each group at a *different* one of these eight cards: *G B J F R M E Q*.
2. **Say this once:** *“The centroid cuts every median into a long piece at the corner and a short piece at the midpoint. The long piece is twice the short piece. Before any arithmetic, write whether the number you know is the long piece, the short piece or the whole median. Eight right answers bring you back to your first card.”*
3. **Each group finds the length, then walks to the card with that number at the top.** Nothing else is needed.

16 cards	pages 3–10, one copy. There are two cards on each sheet. Cut the whole stack once.
Record sheet	page 11, one per student. At the top it shows a median and the centroid as two small drawings, with the rule in three forms.
Answers	pages 12–13, for you only. Do not put them up in the room.

Every card shows one triangle with its three medians. A median joins a corner to the midpoint of the side across. The three medians meet at one point, the centroid. The centroid cuts each median into two pieces. The piece at the corner is twice as long as the piece at the midpoint. So the corner piece is two thirds of the whole median, and the midpoint piece is one third. Each card gives one of these three lengths and asks for another one on the same median. The ring asks in all six directions.

The most common mistake is to turn the ratio upside down. A student halves when the answer needs doubling, or takes one third of the whole median when the long piece needs two thirds. The other common mistake is to take the given piece for the whole median, or the whole median for a piece. Every card has its own mistake, and the answer key names it.

Eight of the sixteen cards make the ring. A group reaches the other eight only by a wrong answer, but all the cards look the same. On every ring card, the common mistake gives the number at the top of one of the eight other cards. That card's answer sends the group back to the card it got wrong. **A clean run is eight lines** on the record sheet, and each wrong answer adds two. If a group keeps coming back to the same cards, do not give the answer. Ask: *“Which end of this median is the corner? Is the number you know a piece or the whole median?”*



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.
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ANSWER

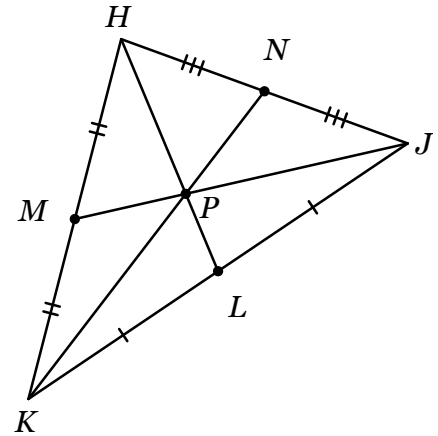
20

L, M and N are midpoints. The medians meet at P.

$$PL = 7$$

How long is HL?

Is the number on the whole median? Then split it into three equal parts.



A

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ANSWER

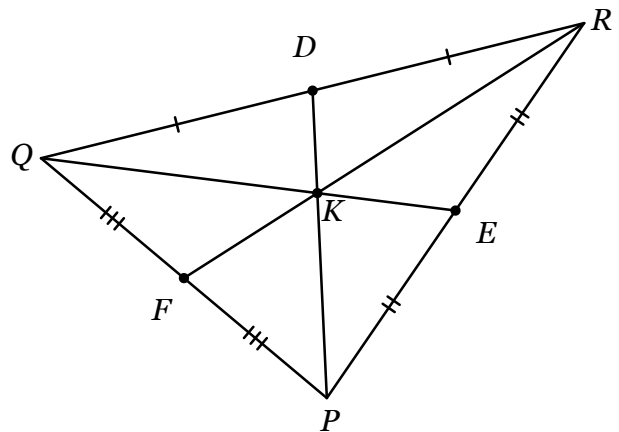
18

D, E and F are midpoints. The medians meet at K.

$$PD = 33$$

How long is PK?

Is the number you know on a piece or on the whole median?



B

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ANSWER

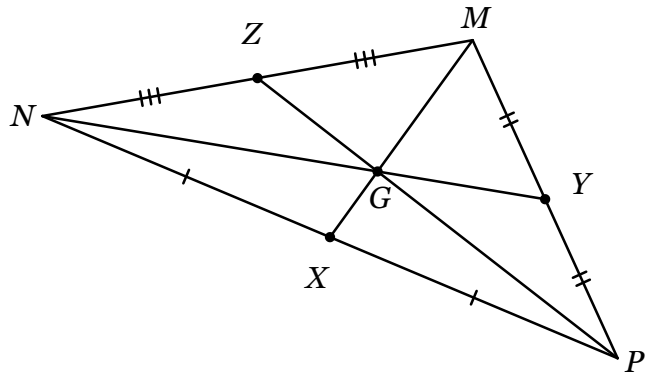
52

X, Y and Z are midpoints. The medians meet at G.

$$MX = 33$$

How long is MG?

Which piece touches the corner? That piece is the long one.



C

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ANSWER

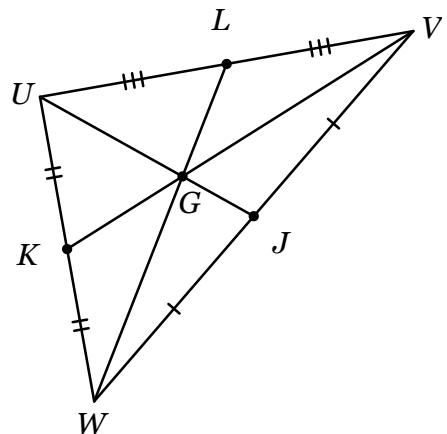
4.5

J, K and L are midpoints. The medians meet at G.

$$UG = 38$$

How long is GJ?

The short piece is half of the long piece.



D

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ANSWER

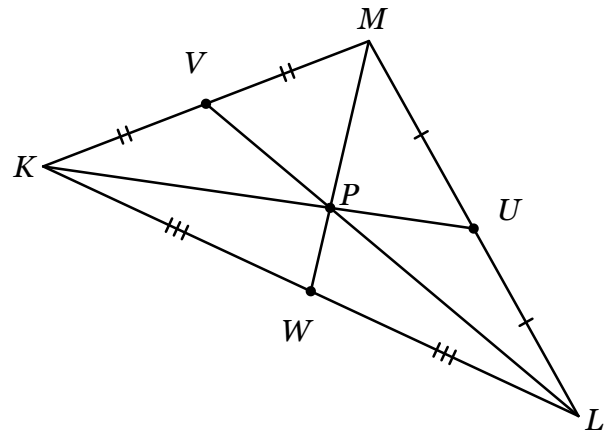
24

U, V and W are midpoints. The medians meet at P.

$$PU = 34$$

How long is KP?

Divide the long piece by the short piece. The answer must be 2.



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E

ANSWER

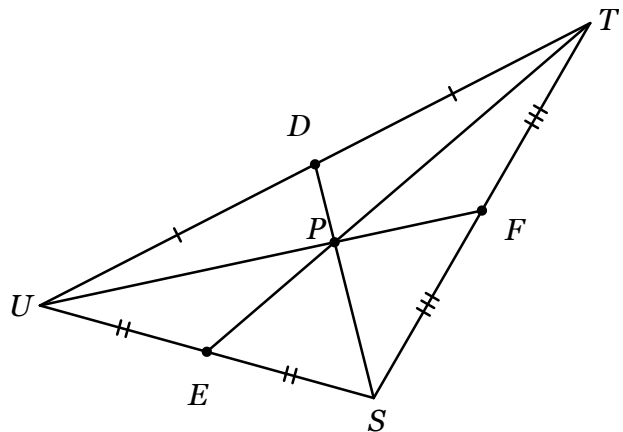
13

D, E and F are midpoints. The medians meet at P.

$$PD = 7$$

How long is SD?

Long piece plus short piece makes the whole median.



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F

ANSWER

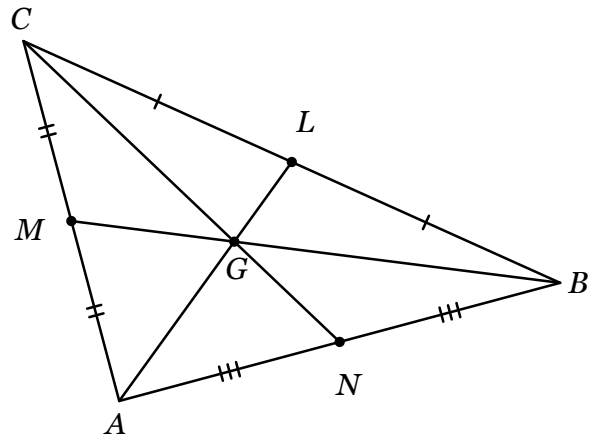
19

L, M and N are midpoints. The medians meet at G.

$$GL = 9$$

How long is AG?

The piece at the corner is long. The piece at the midpoint is short.



G

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ANSWER

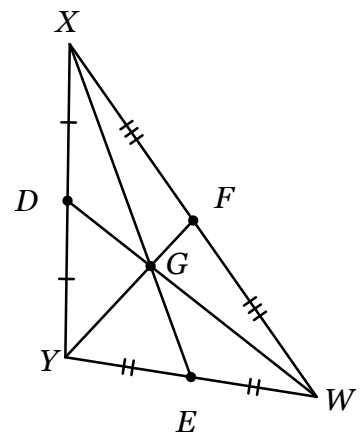
48

D, E and F are midpoints. The medians meet at G.

$$WD = 30$$

How long is GD?

The short piece is one third of the whole median.



H

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ANSWER

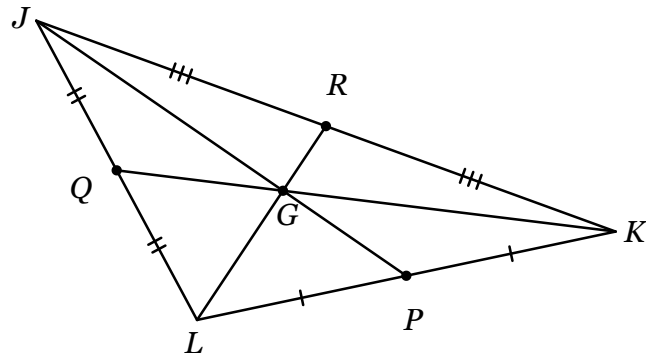
22

P, Q and R are midpoints. The medians meet at G.

$$JG = 26$$

How long is GP?

Write long and short on the two pieces before any number.



J

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ANSWER

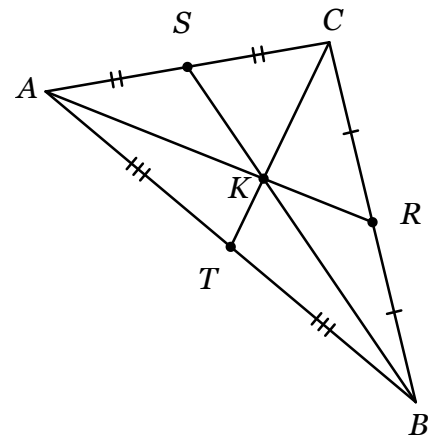
10.5

R, S and T are midpoints. The medians meet at K.

$$AK = 26$$

How long is KR?

The long piece is two thirds of the whole median.



K

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ANSWER

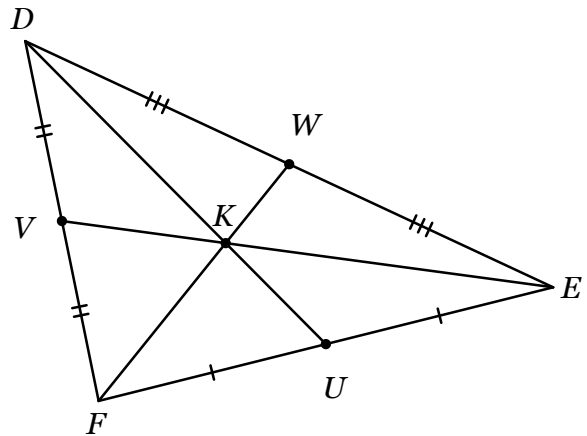
76

U, V and W are midpoints. The medians meet at K.

$$KU = 34$$

How long is DK?

The corner piece is twice the midpoint piece.



L

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ANSWER

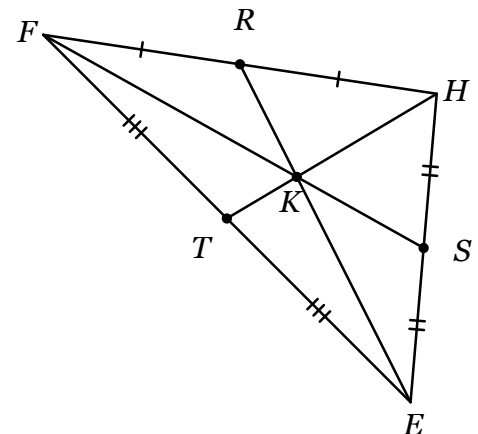
10

R, S and T are midpoints. The medians meet at K.

$$EK = 16$$

How long is ER?

Which end of the median is the corner? The long piece starts at that end.



M

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ANSWER

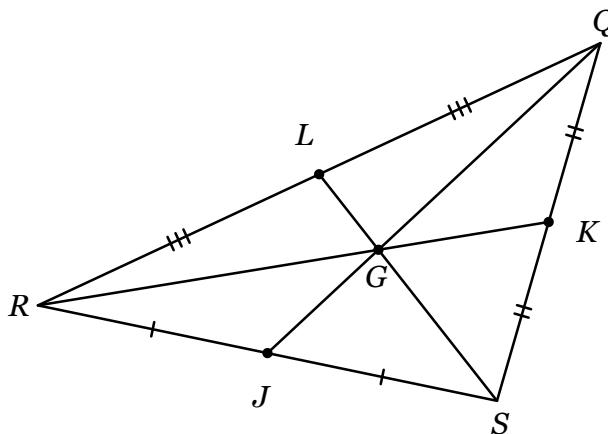
17

J, K and L are midpoints. The medians meet at G.

$$QG = 16$$

How long is QJ?

Add your two pieces. They must make the whole median.



N

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ANSWER

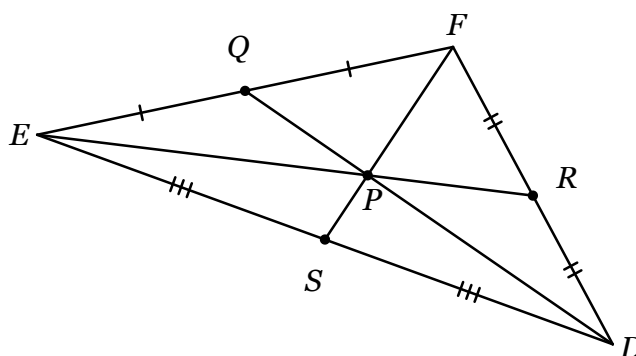
11

Q, R and S are midpoints. The medians meet at P.

$$PQ = 9$$

How long is DP?

Three short pieces make one whole median.



P

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ANSWER

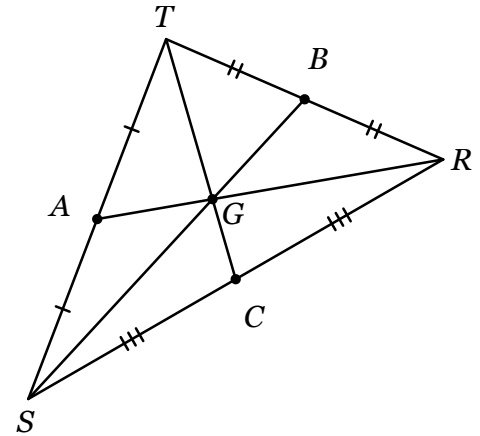
68

A, B and C are midpoints. The medians meet at G.

$$RG = 38$$

How long is GA?

Is your answer bigger or smaller than the number you know?



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Q

ANSWER

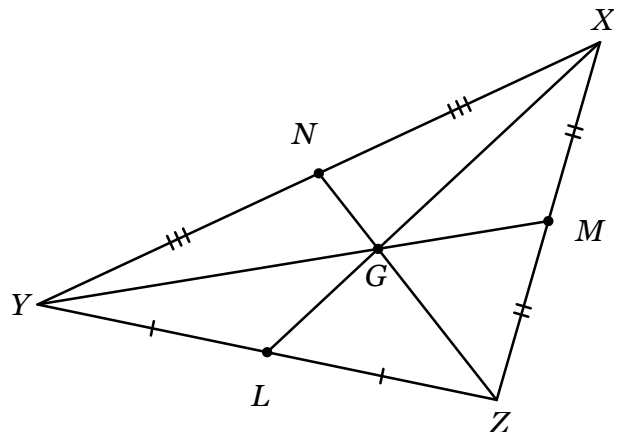
21

L, M and N are midpoints. The medians meet at G.

$$XL = 30$$

How long is GL?

Take a fraction of the whole median, never of a piece.



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R

Scavenger Hunt — where I went

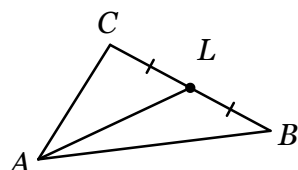
Medians and the centroid

Name _____

Period _____

Date _____

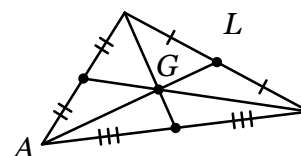
Do the card you are at. Fill in one line. Then find the card with your answer at the top. **Before any arithmetic, write what the number you know is: the long piece, the short piece, or the whole median.** A clean run is eight lines. Each card has a line in small type under the question. **If you are on a card because you went wrong, its line says what to check. If you were right, skip it.**



A **median** joins a corner to the midpoint of the side across.

On every median, the piece at the corner is **long** and the piece at the midpoint is **short**.

$$AG = 2 \times GL \cdot AG = \frac{2}{3} \text{ of } AL \cdot GL = \frac{1}{3} \text{ of } AL$$



The three medians meet at one point, the **centroid** G.

Card letter	The number I know is (long, short or whole)	My answer
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

What does one median say to the other two?

Every number stands for a letter. Write the letter for each of your answers in the box above that number. Leave the other boxes empty. Then read the boxes you filled, left to right. **If they do not spell the answer to the joke, one answer is wrong.**

4.5 = T 10 = L 10.5 = E 11 = M 13 = E 17 = E 18 = T 19 = S 20 = S 21 = M 22 = E 24 = E 48 = L 52 = T 68 = T
76 = E

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4.5 10 10.5 11 13 17 18 19 20 21 22 24 48 52 68 76



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Scavenger Hunt — answers

For the teacher

The ring in order. A group may begin anywhere on it. Wherever it begins, eight right answers bring it back to that card.

G → B → J → F → R → M → E → Q → G

What does one median say to the other two? The answer is *LET'S MEET*. The ring's answers, in the order of the boxes on the record sheet (smallest number first), with their letters: **10 L • 13 E • 18 T • 19 S • 21 M • 22 E • 24 E • 68 T**.

	Card	Given and asked	Answer, and why	Wrong answer from the common mistake	Joke letter for the number at its top
1	G	GL = 9, find AG	18. GL is the short piece, at the midpoint. AG runs from corner A to the centroid G, so it is the long piece, twice the short one: $2 \times 9 = 18$.	4.5, from halving the short piece instead of doubling it	S
2	B	PD = 33, find PK	22. PD is the whole median. PK runs from corner P to the centroid K, so it is the long piece, two thirds of the whole: $33 \div 3 \times 2 = 22$.	11, from taking one third of the whole instead of two thirds	T
3	J	JG = 26, find GP	13. JG runs from corner J to the centroid G, so it is the long piece. GP is the short piece, half of it: $26 \div 2 = 13$.	52, from doubling the long piece instead of halving it	E
4	F	PD = 7, find SD	21. PD is the short piece. The whole median is three short pieces: $3 \times 7 = 21$.	10.5, from taking the short piece for the long one	E
5	R	XL = 30, find GL	10. XL is the whole median. GL is the short piece, one third of the whole: $30 \div 3 = 10$.	20, from taking two thirds of the whole instead of one third	M
6	M	EK = 16, find ER	24. EK runs from corner E to the centroid K, so it is the long piece. The short piece is half of it, 8. The whole median is $16 + 8 = 24$.	48, from taking the long piece for the short one	L
7	E	PU = 34, find KP	68. PU is the short piece, at the midpoint. KP runs from corner K to the centroid P, so it is the long piece, twice the short one: $2 \times 34 = 68$.	17, from halving the short piece instead of doubling it	E
8	Q	RG = 38, find GA	19. RG runs from corner R to the centroid G, so it is the long piece. GA is the short piece, half of it: $38 \div 2 = 19$.	76, from doubling the long piece instead of halving it	T

Each wrong answer in the table is the number at the top of a card off the ring. Those cards are on the next page.

Scavenger Hunt — the cards off the ring

For the teacher

A group reaches these eight cards only by a wrong answer. The number at the top of each one is the wrong answer from one ring card. Its right answer is the number at the top of that ring card, so the group goes back to the card it got wrong. If the group makes the same mistake again, it goes to another card off the ring. So a second wrong answer never moves a group forward.

Card	Given and asked	Answer, and why	Wrong answer from the common mistake	Joke letter for the number at its top
D	UG = 38, find GJ	19. UG runs from corner U to the centroid G, so it is the long piece. GJ is the short piece, half of it: $38 \div 2 = 19$.	76, from doubling the long piece instead of halving it	T
P	PQ = 9, find DP	18. PQ is the short piece, at the midpoint. DP runs from corner D to the centroid P, so it is the long piece, twice the short one: $2 \times 9 = 18$.	4.5, from halving the short piece instead of doubling it	M
C	MX = 33, find MG	22. MX is the whole median. MG runs from corner M to the centroid G, so it is the long piece, two thirds of the whole: $33 \div 3 \times 2 = 22$.	11, from taking one third of the whole instead of two thirds	T
K	AK = 26, find KR	13. AK runs from corner A to the centroid K, so it is the long piece. KR is the short piece, half of it: $26 \div 2 = 13$.	52, from doubling the long piece instead of halving it	E
A	PL = 7, find HL	21. PL is the short piece. The whole median is three short pieces: $3 \times 7 = 21$.	10.5, from taking the short piece for the long one	S
H	WD = 30, find GD	10. WD is the whole median. GD is the short piece, one third of the whole: $30 \div 3 = 10$.	20, from taking two thirds of the whole instead of one third	L
N	QG = 16, find QJ	24. QG runs from corner Q to the centroid G, so it is the long piece. The short piece is half of it, 8. The whole median is $16 + 8 = 24$.	48, from taking the long piece for the short one	E
L	KU = 34, find DK	68. KU is the short piece, at the midpoint. DK runs from corner D to the centroid K, so it is the long piece, twice the short one: $2 \times 34 = 68$.	17, from halving the short piece instead of doubling it	E

Other mistakes lead to no card at all. A group might copy the given number, give the whole median when a piece is asked, or take two thirds of a piece that is already two thirds of the median. Its answer is then not the number at the top of any card, and the group knows to check its work.

Guessing does not work. Every simple rule that uses only the printed number, such as always doubling it, answers at most six of the sixteen cards correctly.