

SCAVENGER HUNT



SIMILAR TRIANGLES: CORRESPONDING ANGLES AND SIDES

Which Side Is Its Partner?

Two similar triangles on every card · no marks on the drawing · the cards check the answers

FREE

ANSWER

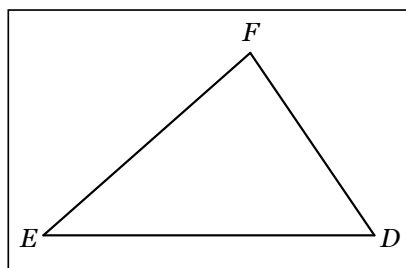
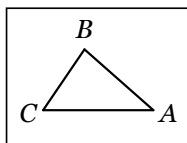
35

$\triangle ABC \sim \triangle EFD$

In $\triangle ABC$, $BC = 8$, $CA = 12$ and $AB = 10$. In $\triangle EFD$, $DE = 36$.

How long is EF?

Read the statement in order. The first letters are partners. So are the second and the third.



B

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Scavenger Hunt — how to run it

a full class period

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: *B E M R L N F D*.
2. **Say this once:** *“Use the letters of the statement to find the partner of each side. First find the scale factor. Then multiply. 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. A box on it shows how a similarity statement pairs the letters.
Answers	pages 12–13, for you only. Do not put them up in the room.

Every card gives the same kind of problem. Two similar triangles stand side by side with nothing marked, and a similarity statement such as $\triangle ABC \sim \triangle DEF$ is printed. Three sides of one triangle are given, and one side of the other. The group finds the scale factor from the two sides that are partners, then multiplies the partner of the side asked for. The second triangle is always drawn as a mirror copy of the first. So a group that matches sides by where they stand on the page (left side with left side) gets the scale factor right but multiplies the wrong side.

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, matching by the page gives the number at the top of one of the eight other cards. The group does that card, and its right answer sends the group back to the card it got wrong. In every question, the three sides given for the first triangle are smaller than every number at the top of a card. So a group that copies a side across, as if the triangles were congruent, finds no card and knows at once that something is wrong.

The check is the length of the group's list. A clean run is **eight lines**. Each wrong answer adds two. Every card has a line in small type under the question. It tells a group that arrived by a wrong answer what to check. A group that arrived by a right answer skips it. If a group keeps coming back to the same cards, do not give the answer. Ask: *“Write the two names one above the other. Which letters are under the letters of the side you want?”*



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

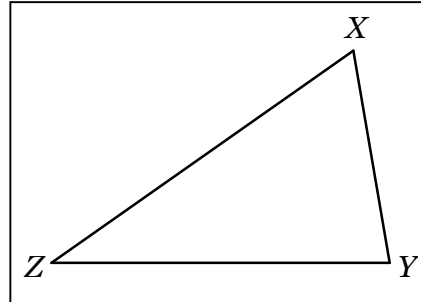
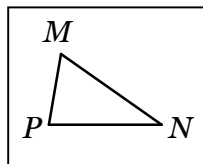
27.5

$$\triangle MNP \sim \triangle XZY$$

In $\triangle MNP$, $NP = 11$, $PM = 7$ and $MN = 12$. In $\triangle XZY$, $YZ = 33$.

How long is XY?

Does one triangle look like a mirror copy? Read the letters, not the shape.



A

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ANSWER

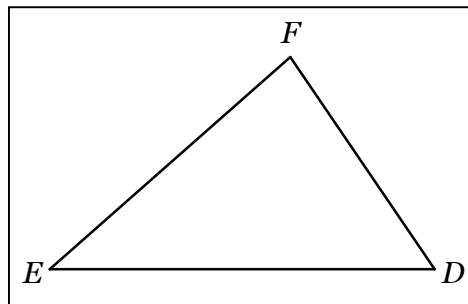
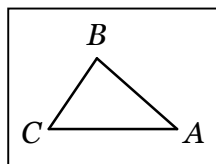
35

$$\triangle ABC \sim \triangle EFD$$

In $\triangle ABC$, $BC = 8$, $CA = 12$ and $AB = 10$. In $\triangle EFD$, $DE = 36$.

How long is EF?

Read the statement in order. The first letters are partners. So are the second and the third.



B

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ANSWER

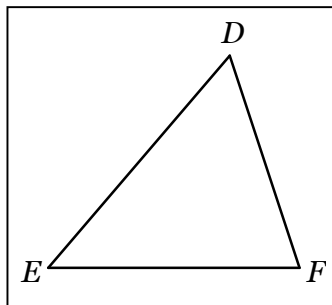
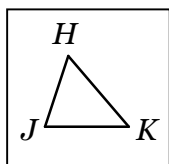
22

$\triangle HJK \sim \triangle DFE$

In $\triangle HJK$, $JK = 9$, $HJ = 8$ and $KH = 10$. In $\triangle DFE$, $FE = 27$.

How long is DE?

Say the pairs out loud. First with first, second with second, third with third.



C

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ANSWER

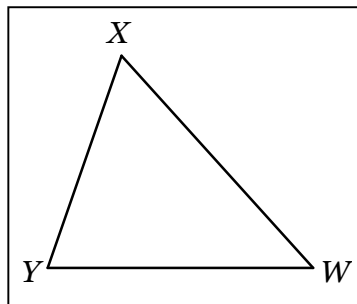
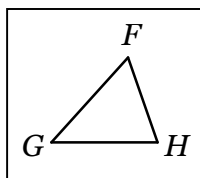
21

$\triangle FGH \sim \triangle XWY$

In $\triangle FGH$, $HF = 11$, $FG = 14$ and $GH = 13$. In $\triangle XWY$, $WY = 32.5$.

How long is XW?

The drawing can fool you. The statement says which sides go together.



D

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ANSWER

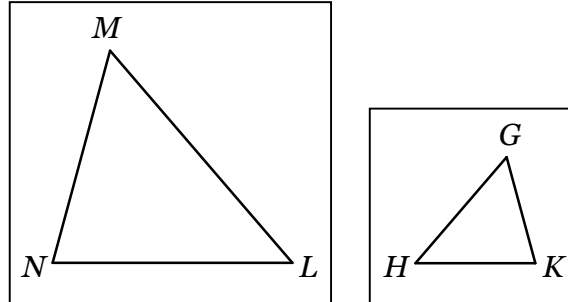
30

$\triangle MLN \sim \triangle GHK$

In $\triangle GHK$, $GK = 11$, $HK = 12$ and $GH = 14$. In $\triangle MLN$, $LN = 24$.

How long is ML?

Do not match sides by their place on the page. Match them by the letters.



E

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ANSWER

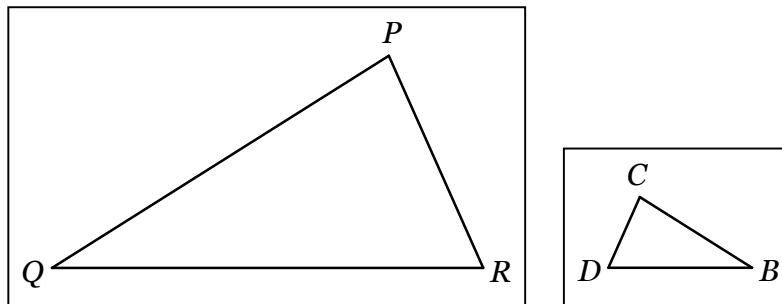
16

$\triangle BCD \sim \triangle QPR$

In $\triangle BCD$, $DB = 13$, $BC = 12$ and $CD = 7$. In $\triangle QPR$, $RQ = 39$.

How long is PR?

Which side of the small triangle goes with the side you want? Multiply that one.



F

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ANSWER

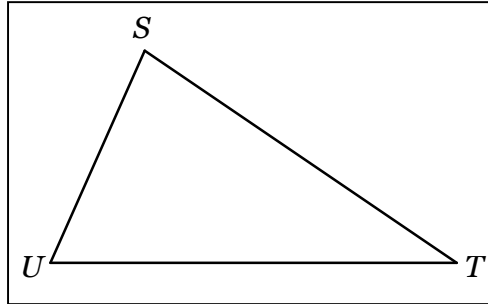
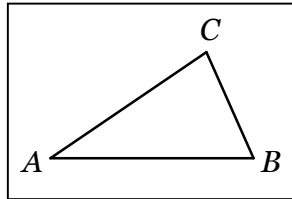
36

$\triangle STU \sim \triangle CAB$

In $\triangle CAB$, $CA = 13$, $AB = 14$ and $BC = 8$. In $\triangle STU$, $TU = 28$.

How long is SU?

Are two left sides always partners? Check the letters of both sides.



G

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ANSWER

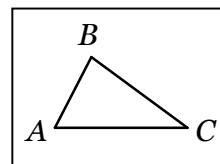
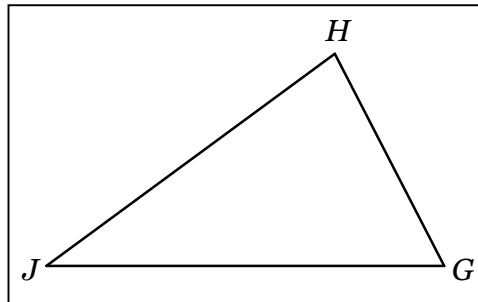
15

$\triangle ABC \sim \triangle GHJ$

In $\triangle ABC$, $CA = 10$, $AB = 6$ and $BC = 9$. In $\triangle GHJ$, $GJ = 30$.

How long is HJ?

Check the side you multiply. Its letters are partners of the letters you want.



H

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ANSWER

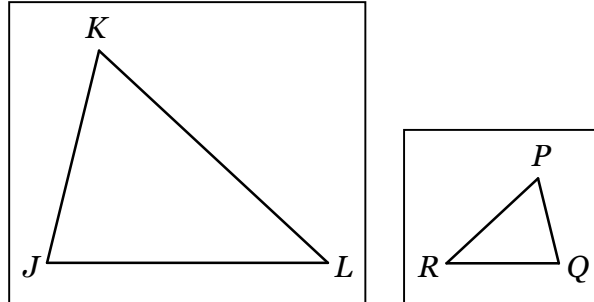
26

$\triangle PQR \sim \triangle KJL$

In $\triangle PQR$, $RP = 10$, $QR = 9$ and $PQ = 7$. In $\triangle KJL$, $LJ = 22.5$.

How long is KJ?

Point to each letter of the side. Find the letter under it in the stack.



J

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ANSWER

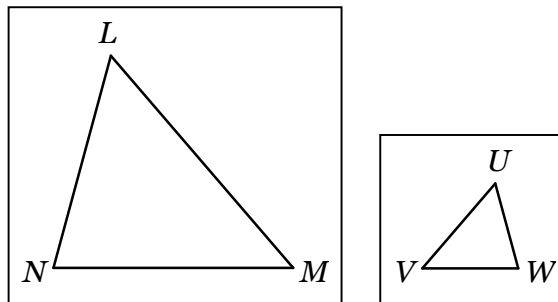
24

$\triangle LMN \sim \triangle UVW$

In $\triangle UVW$, $VW = 12$, $UV = 14$ and $WU = 11$. In $\triangle LMN$, $MN = 30$.

How long is LM?

Is the answer longer than its partner? Look at which triangle is larger.



K

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ANSWER

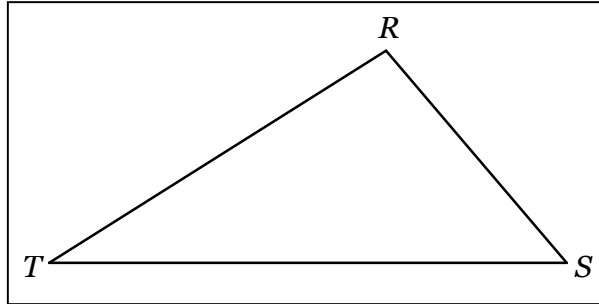
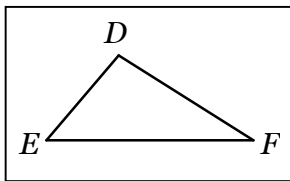
22.5

$\triangle DEF \sim \triangle RST$

In $\triangle DEF$, $FD = 10$, $DE = 7$ and $EF = 13$. In $\triangle RST$, $ST = 32.5$.

How long is RS?

A side has two letters. Find the partner of each letter, one at a time.



L

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ANSWER

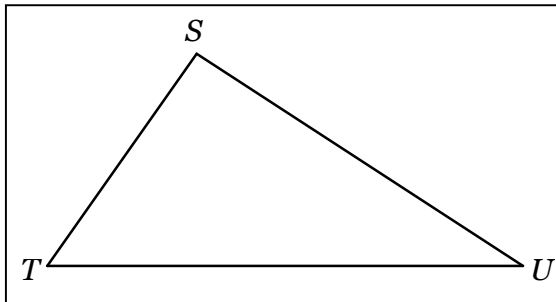
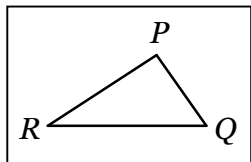
28

$\triangle PQR \sim \triangle STU$

In $\triangle PQR$, $QR = 11$, $RP = 9$ and $PQ = 6$. In $\triangle STU$, $UT = 33$.

How long is SU?

Write the two names one above the other. Partners stand in the same column.



M

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ANSWER

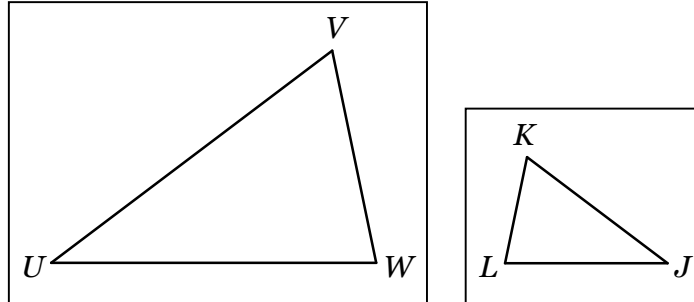
17.5

$\triangle UVW \sim \triangle JKL$

In $\triangle JKL$, $KL = 8$, $LJ = 12$ and $JK = 13$. In $\triangle UVW$, $WU = 24$.

How long is VW?

One triangle can be a mirror copy of the other. The letters still decide.



N

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ANSWER

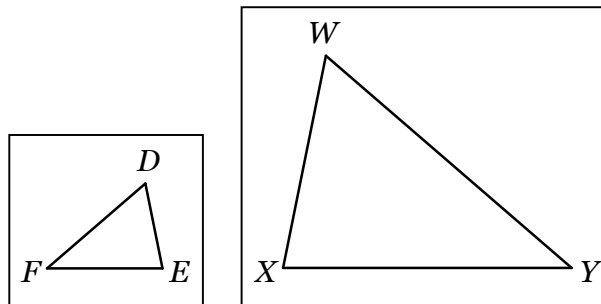
25

$\triangle WXY \sim \triangle DEF$

In $\triangle DEF$, $DE = 6$, $FD = 9$ and $EF = 8$. In $\triangle WXY$, $YX = 20$.

How long is WY?

The order of the letters holds the pairs. Read the statement slowly.



P

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ANSWER

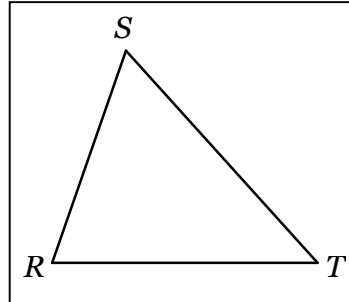
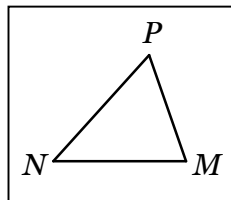
18

$\triangle RST \sim \triangle MPN$

In $\triangle MPN$, $PN = 14$, $NM = 13$ and $MP = 11$. In $\triangle RST$, $TR = 26$.

How long is ST?

Which letter comes first in the second name? It is the partner of the first letter.



Q

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ANSWER

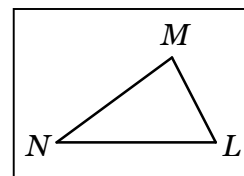
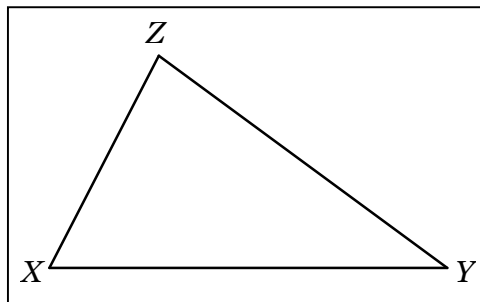
27

$\triangle XYZ \sim \triangle LNM$

In $\triangle LNM$, $NM = 9$, $ML = 6$ and $LN = 10$. In $\triangle XYZ$, $YX = 25$.

How long is YZ?

Find the scale factor first. It comes from two sides that are partners.



R

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Scavenger Hunt — where I went

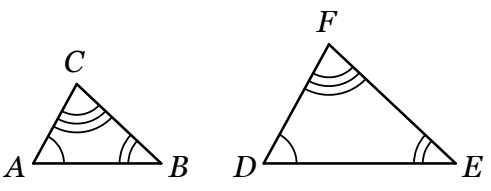
Similar triangles

Name _____

Period _____

Date _____

Do the card you are at. Fill in one line. Then find the card with your answer at the top. **Use the letters, not the places on the page.** 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.**



$\triangle ABC \sim \triangle DEF$. Write the two names one above the other.

$\triangle$	A	B	C
$\triangle$	D	E	F

Letters in the same column are partners. Equal angles: $\angle A = \angle D$, $\angle B = \angle E$, $\angle C = \angle F$. AB goes with DE.

Equal ratios: $\frac{DE}{AB} = \frac{EF}{BC} = \frac{FD}{CA}$. This number is the scale factor.

Card letter	The side I want, and its partner	Scale factor	My answer
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

What does a big triangle say when it meets a small triangle that is similar to it?

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 of your answers is wrong.**

15 = E 16 = L 17.5 = I 18 = M 21 = T 22 = E 22.5 = T 24 = L 25 = T 26 = T 27 = L 27.5 = I 28 = E 30 = M
35 = E 36 = L

15	16	17.5	18	21	22	22.5	24	25	26	27	27.5	28	30	35	36



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Scavenger Hunt — answers

For the teacher

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

B (30) → E (28) → M (27) → R (22.5) → L (17.5) → N (16) → F (21) → D (35) → B

What does a big triangle say when it meets a small triangle that is similar to it? The answer is *LITTLE ME*. It is read along the boxes of the record sheet, which run from the smallest number to the largest.

Card	The question on the card	Answer, and why	Wrong answer from matching by place on the page	Joke letter for the number at its top
1 B	$\triangle ABC \sim \triangle EFD$. In $\triangle ABC$, $BC = 8$, $CA = 12$, $AB = 10$. In $\triangle EFD$, $DE = 36$. How long is EF ?	30. D goes with C and E with A, so DE goes with CA : the scale factor is $36 \div 12 = 3$. E goes with A and F with B, so EF goes with AB : $EF = 10 \times 3 = 30$.	24. CB is on the same side of its triangle (left or right) as EF is on its own, and $8 \times 3 = 24$.	E
2 E	$\triangle MLN \sim \triangle GHK$. In $\triangle GHK$, $GK = 11$, $HK = 12$, $GH = 14$. In $\triangle MLN$, $LN = 24$. How long is ML ?	28. L goes with H and N with K, so LN goes with HK : the scale factor is $24 \div 12 = 2$. M goes with G and L with H, so ML goes with GH : $ML = 14 \times 2 = 28$.	22. GK is on the same side of its triangle (left or right) as ML is on its own, and $11 \times 2 = 22$.	M
3 M	$\triangle PQR \sim \triangle STU$. In $\triangle PQR$, $QR = 11$, $RP = 9$, $PQ = 6$. In $\triangle STU$, $UT = 33$. How long is SU ?	27. U goes with R and T with Q, so UT goes with RQ : the scale factor is $33 \div 11 = 3$. S goes with P and U with R, so SU goes with PR : $SU = 9 \times 3 = 27$.	18. PQ is on the same side of its triangle (left or right) as SU is on its own, and $6 \times 3 = 18$.	E
4 R	$\triangle XYZ \sim \triangle LNM$. In $\triangle LNM$, $NM = 9$, $ML = 6$, $LN = 10$. In $\triangle XYZ$, $YX = 25$. How long is YZ ?	22.5. Y goes with N and X with L, so YX goes with NL : the scale factor is $25 \div 10 = 2.5$. Y goes with N and Z with M, so YZ goes with NM : $YZ = 9 \times 2.5 = 22.5$.	15. LM is on the same side of its triangle (left or right) as YZ is on its own, and $6 \times 2.5 = 15$.	L
5 L	$\triangle DEF \sim \triangle RST$. In $\triangle DEF$, $FD = 10$, $DE = 7$, $EF = 13$. In $\triangle RST$, $ST = 32.5$. How long is RS ?	17.5. S goes with E and T with F, so ST goes with EF : the scale factor is $32.5 \div 13 = 2.5$. R goes with D and S with E, so RS goes with DE : $RS = 7 \times 2.5 = 17.5$.	25. DF is on the same side of its triangle (left or right) as RS is on its own, and $10 \times 2.5 = 25$.	T
6 N	$\triangle UVW \sim \triangle JKL$. In $\triangle JKL$, $KL = 8$, $LJ = 12$, $JK = 13$. In $\triangle UVW$, $WU = 24$. How long is VW ?	16. W goes with L and U with J, so WU goes with LJ : the scale factor is $24 \div 12 = 2$. V goes with K and W with L, so VW goes with KL : $VW = 8 \times 2 = 16$.	26. KJ is on the same side of its triangle (left or right) as VW is on its own, and $13 \times 2 = 26$.	I
7 F	$\triangle BCD \sim \triangle QPR$. In $\triangle BCD$, $DB = 13$, $BC = 12$, $CD = 7$. In $\triangle QPR$, $RQ = 39$. How long is PR ?	21. R goes with D and Q with B, so RQ goes with DB : the scale factor is $39 \div 13 = 3$. P goes with C and R with D, so PR goes with CD : $PR = 7 \times 3 = 21$.	36. CB is on the same side of its triangle (left or right) as PR is on its own, and $12 \times 3 = 36$.	L
8 D	$\triangle FGH \sim \triangle XWY$. In $\triangle FGH$, $HF = 11$, $FG = 14$, $GH = 13$. In $\triangle XWY$, $WY = 32.5$. How long is XW ?	35. W goes with G and Y with H, so WY goes with GH : the scale factor is $32.5 \div 13 = 2.5$. X goes with F and W with G, so XW goes with FG : $XW = 14 \times 2.5 = 35$.	27.5. FH is on the same side of its triangle (left or right) as XW is on its own, and $11 \times 2.5 = 27.5$.	T

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 matches by place on the page again, it goes to another card off the ring. So a second wrong answer never moves a group forward.

Card	The question on the card	Answer, and why	Wrong answer from matching by place on the page	Joke letter for the number at its top
K	$\triangle LMN \sim \triangle UVW$. In $\triangle UVW$, $VW = 12$, $UV = 14$, $WU = 11$. In $\triangle LMN$, $MN = 30$. How long is LM ?	35. M goes with V and N with W, so MN goes with VW: the scale factor is $30 \div 12 = 2.5$. L goes with U and M with V, so LM goes with UV: $LM = 14 \times 2.5 = 35$.	27.5. UW is on the same side of its triangle (left or right) as LM is on its own, and $11 \times 2.5 = 27.5$.	L
C	$\triangle HJK \sim \triangle DFE$. In $\triangle HJK$, $JK = 9$, $HJ = 8$, $KH = 10$. In $\triangle DFE$, $FE = 27$. How long is DE ?	30. F goes with J and E with K, so FE goes with JK: the scale factor is $27 \div 9 = 3$. D goes with H and E with K, so DE goes with HK: $DE = 10 \times 3 = 30$.	24. HJ is on the same side of its triangle (left or right) as DE is on its own, and $8 \times 3 = 24$.	E
Q	$\triangle RST \sim \triangle MPN$. In $\triangle MPN$, $PN = 14$, $NM = 13$, $MP = 11$. In $\triangle RST$, $TR = 26$. How long is ST ?	28. T goes with N and R with M, so TR goes with NM: the scale factor is $26 \div 13 = 2$. S goes with P and T with N, so ST goes with PN: $ST = 14 \times 2 = 28$.	22. PM is on the same side of its triangle (left or right) as ST is on its own, and $11 \times 2 = 22$.	M
H	$\triangle ABC \sim \triangle GHJ$. In $\triangle ABC$, $CA = 10$, $AB = 6$, $BC = 9$. In $\triangle GHJ$, $GJ = 30$. How long is HJ ?	27. G goes with A and J with C, so GJ goes with AC: the scale factor is $30 \div 10 = 3$. H goes with B and J with C, so HJ goes with BC: $HJ = 9 \times 3 = 27$.	18. BA is on the same side of its triangle (left or right) as HJ is on its own, and $6 \times 3 = 18$.	E
P	$\triangle WXY \sim \triangle DEF$. In $\triangle DEF$, $DE = 6$, $FD = 9$, $EF = 8$. In $\triangle WXY$, $YX = 20$. How long is WY ?	22.5. Y goes with F and X with E, so YX goes with FE: the scale factor is $20 \div 8 = 2.5$. W goes with D and Y with F, so WY goes with DF: $WY = 9 \times 2.5 = 22.5$.	15. DE is on the same side of its triangle (left or right) as WY is on its own, and $6 \times 2.5 = 15$.	T
J	$\triangle PQR \sim \triangle KJL$. In $\triangle PQR$, $RP = 10$, $QR = 9$, $PQ = 7$. In $\triangle KJL$, $LJ = 22.5$. How long is KJ ?	17.5. L goes with R and J with Q, so LJ goes with RQ: the scale factor is $22.5 \div 9 = 2.5$. K goes with P and J with Q, so KJ goes with PQ: $KJ = 7 \times 2.5 = 17.5$.	25. PR is on the same side of its triangle (left or right) as KJ is on its own, and $10 \times 2.5 = 25$.	T
G	$\triangle STU \sim \triangle CAB$. In $\triangle CAB$, $CA = 13$, $AB = 14$, $BC = 8$. In $\triangle STU$, $TU = 28$. How long is SU ?	16. T goes with A and U with B, so TU goes with AB: the scale factor is $28 \div 14 = 2$. S goes with C and U with B, so SU goes with CB: $SU = 8 \times 2 = 16$.	26. CA is on the same side of its triangle (left or right) as SU is on its own, and $13 \times 2 = 26$.	L
A	$\triangle MNP \sim \triangle XZY$. In $\triangle MNP$, $NP = 11$, $PM = 7$, $MN = 12$. In $\triangle XZY$, $YZ = 33$. How long is XY ?	21. Y goes with P and Z with N, so YZ goes with PN: the scale factor is $33 \div 11 = 3$. X goes with M and Y with P, so XY goes with MP: $XY = 7 \times 3 = 21$.	36. MN is on the same side of its triangle (left or right) as XY is on its own, and $12 \times 3 = 36$.	I

Other mistakes lead to no card. A group might copy the partner's length across, as if the triangles were congruent. It might divide by the scale factor instead of multiplying. Its answer is then not the number at the top of any card.

Guessing does not work. Every simple guessing rule, such as always multiplying the largest printed side, answers at most six of the sixteen cards correctly.