

Sine and cosine rules: which step breaks?

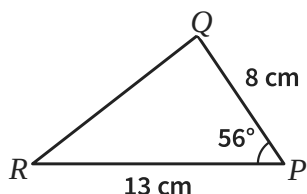
ANSWERS

Name _____

These follow one question in order. Triangle PQR has PQ = 8 cm, PR = 13 cm and angle P = 56°. Find QR, then angle R: label the sides, choose the rule, substitute, solve, then choose, substitute and solve again.

- 1 Name the side opposite angle P and the side opposite angle R.

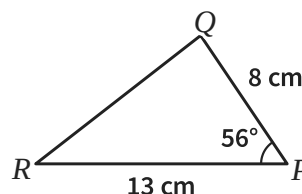
STEP 1: LABEL THE SIDES • FIX IT CARD 1



QR and PQ

- 2 QR is opposite angle P. Which rule finds QR: sine or cosine?

STEP 2: SINE RULE OR COSINE RULE? • FIX IT CARD 2



Cosine rule: no pair

- 3 Substitute the numbers into the cosine rule to find QR.

STEP 3: SUBSTITUTE: THE COSINE RULE • FIX IT CARD 4

$$QR^2 = 13^2 + 8^2 - 2 \times 13 \times 8 \times \cos 56^\circ$$

- 4 $QR^2 = 13^2 + 8^2 - 2 \times 13 \times 8 \times \cos 56^\circ$. Find QR to 1 decimal place.

STEP 4: SOLVE FOR A SIDE: THE COSINE RULE • FIX IT CARD 7

$$QR = 10.8 \text{ cm}$$

- 5 QR is 10.8 cm. Which rule finds angle R now: sine or cosine?

STEP 5: SINE RULE OR COSINE RULE? • FIX IT CARD 2

Sine rule: QR and 56° pair

- 6 Angle R is opposite PQ = 8 cm. Substitute the numbers into the sine rule to find angle R.

STEP 6: SUBSTITUTE: THE SINE RULE • FIX IT CARD 3

$$\frac{\sin R}{8} = \frac{\sin 56^\circ}{10.8}$$

- 7 $\frac{\sin R}{8} = \frac{\sin 56^\circ}{10.8}$. Find angle R to 1 decimal place.

STEP 7: SOLVE FOR AN ANGLE: THE SINE RULE • FIX IT CARD 6

$$R = 37.9^\circ$$

The first question wrong is the step that breaks. Give that student the card it names.

The Maths Habit