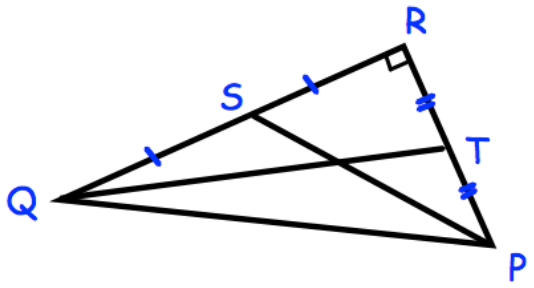
May 31st

In the triangle PQR, angle QRP = 90°
S is the midpoint of QR.
T is the midpoint of PR.
PS = 4cm.
QT = 7cm.
Calculate PQ.



Label x = PR y=QR

Pythagoras

In triangle PRS: $x^2 + (\frac{1}{2}y)^2 = 4^2$ $\therefore x^2 + \frac{1}{4}y^2 = 16$ (1)

In triangle QRT: $(\frac{1}{2}x)^2 + y^2 = 7^2$ $\therefore \frac{1}{4}x^2 + y^2 = 49$ (2)

4 x (1) gives

$4x^2 + y^2 = 64$ (3)

Subtracting (2) from (3) gives

$3\frac{3}{4}x^2 = 15$

$x^2 = 4$

Substituting into (3) gives

$16 + y^2 = 64$

Hence

$y^2 = 48$

$PQ^2 = x^2 + y^2 = 4 + 48 = 52$

$PQ = 2\sqrt{13}$ cm