



## Problem of the Week

### Problem C

### Partitioned Pentagon

Consider pentagon  $PQRST$ . Starting at  $P$  and moving around the pentagon, the vertices are labelled  $P$ ,  $Q$ ,  $R$ ,  $S$ , and  $T$ , in order.

The pentagon has right angles at  $P$ ,  $Q$ , and  $R$ , obtuse angles at  $S$  and  $T$ , and an area of  $1000 \text{ cm}^2$ .

Point  $V$  lies inside the pentagon such that  $\angle PTV$ ,  $\angle TVS$ , and  $\angle VSR$  are right angles.

Point  $U$  lies on  $TV$  such that  $\triangle STU$  has an area of  $210 \text{ cm}^2$ . Also, it is known that  $PQ = 50 \text{ cm}$ ,  $SR = 15 \text{ cm}$ , and  $TU = 30 \text{ cm}$ .

Determine the length of  $PT$ .

