

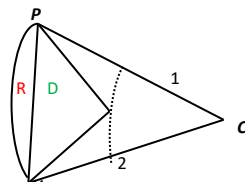
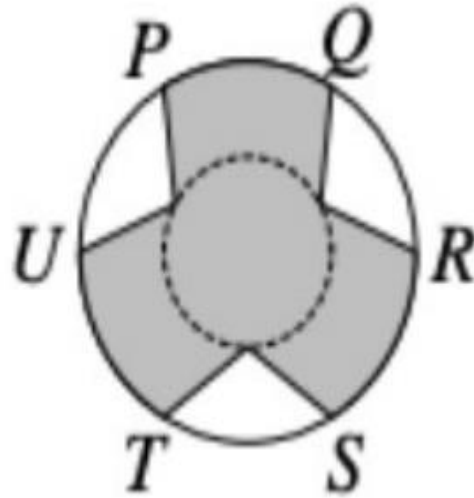
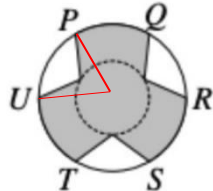
Week8 Maths Puzzle: Harder

*solution by Samuel Broncek KRB Diversity*

circumference and/or area of larger circle =  $4\pi$

area of sector UP =  
 $\frac{1}{6} * 4\pi$

Shaded area of sector UP  
 $= \frac{1}{6} * 4\pi - R - D$



$D = \frac{1}{2} \text{ base} * \text{height}$

$\frac{1}{2} \text{ Base} = 2 * \sin(30) = 1$

Height =  $2 * \cos(30) - 1$

$D = 2 * \cos(30) - 1$

$R = \text{area of sector} - \text{area of triangle UPC}$

$= \frac{1}{6} * 4\pi - \frac{1}{2} \text{ Base} * \text{Height}$

$= \frac{1}{6} * 4\pi - 1 * 2 * \cos(30)$

$R = \frac{1}{6} * 4\pi - 2 * \cos(30)$

Shaded area of sector UP =  $\frac{1}{6} * 4\pi - R - D$

$= \frac{1}{6} * 4\pi - (\frac{1}{6} * 4\pi - 2 * \cos(30)) - (2 * \cos(30) - 1)$

$= \cos(30) + 1$

Total Shaded area =  $3 * \text{Shaded area of sector UP} + 3 * \frac{1}{6} * 4\pi$

$= 3(1) + 3 * \frac{1}{6} * 4\pi$

$= 3 + 2\pi$