

Alternate solution for snack 48 :

Let $A = \text{Area}$, $P = \text{Perimeter}$, $c = \text{hypotenuse}$, a and $b = \text{legs}$.

$$P = (a + b) + \sqrt{a^2 + b^2}, \text{ so } a^2 + b^2 = (P - (a + b))^2$$

Expand and simplify :

$$2P(a + b) = P^2 + 2ab, \text{ so } a + b = \frac{(P^2 + 4A)}{2P}$$

$$\text{So } c = P - (a + b) = P - \frac{P^2 + 4A}{2P} = \frac{P^2 - 4A}{2P}$$

Substituting gives

$$c = \frac{72^2 - 4 \cdot 216}{144} = 30$$

So the area of the circle is $225\pi \text{ cm}^2$