7

f) $n_v(S) = n_t(S)\left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \dots + \frac{1}{x_n}\right)$

For a tile uniform tiling of tile type $[x_1, x_2, x_3, \dots, x_n]$

By inspection S is tile uniform of tile type [3,4,6,4], and has 6 translational tiles orbits

$\therefore n_v(S) = 6\left(\frac{1}{3} + \frac{1}{4} + \frac{1}{6} + \frac{1}{4}\right) = 6.$ ✓

3/3

g) Tile type [4848] has 2 translational tile orbits, and tile type [448] has four translational tile orbits

For the tile type [4848], each dot representing a tile orbit has coming out of it:

Two lines going to an orbit of vertices of degree 4

Two lines going to an orbit of vertices of degree 8

Of the lines going to the orbits of vertices of degree 4, each makes 1/4 of the total contribution to the lines going into these orbits. There are two lines representing two translational tile orbits.

Thus the vertex of degree 4 generates $2 \times 1/4 = 1/2$ vertex orbits. The same applies to each vertex of degree 4 and 8 in the tile type:

$n_v'(S) = 2\left(\frac{1}{4} + \frac{1}{8} + \frac{1}{4} + \frac{1}{8}\right) = \frac{3}{2}$ ✓

For the tile type [448] each dot representing a tile orbit has coming out of it:

2 lines going to orbits of vertices of degree 4