1) $3^{2n} + 2^{2n+2}$ habis di bagi 5?

langkah 1

$n = 1$

$3^{2(1)} + 2^{2(1)+2} = 3^2 + 2^4 = 9 + 16 = 25 = \dfrac{25}{5} = 5$ ✓

langkah 2

$n = k$

$3^{2k} + 2^{2k+2} = 5$

langkah 3

$n = k+1$

$3^{2(k+1)} + 2^{2(k+1)} + 2 = 3^{2k+2} + 2^{2k+2+2} = 3^{2k} * 3^2 + 2^{2k+2} \times 2^2$

$= 3^{2k} \times 9 + 2^{2k+2} \times 4 = 10(3^{2k}) + 5(2^{2k+2}) - 3^{2k} - 2^{2k+2}$

$= 10(3^{2k}) + 5(2^{2k+2}) - (3^{2k} + 2^{2k+2})$

$\cancel{10(3^{2k})}$ ✓

$\cancel{5(2^{2k+1})}$ ✓

$\cancel{3^{2k} + 2^{2k+2} = 5}$ ✓

② $5^{(2n)2n^0} + (3n-1)^{10/2}$ habis di bagi 9

↓ di sederhanakan

$5^{(2n)} + 3n - 1$

langkah 1

n = 1

$5^{(2.1)} + 3.1 - 1$ = $25 + 2 = 27$ · $\dfrac{27}{9} = 3$ ✓

langkah 2

n = k

$5^{(2k)} + 3k - 1 = 9$

langkah 3

n = k+1

$5^{2(k+1)} + 3.(k+1) - 1$ $\Big|$ = $5^2(5^{2k}) + 3k + 3 - 1$

= $25 . 5^{2k} + 3k + 3 - 1$

= $24 . 5^{2k} + 5^{2k} + 3k - 1 + 3$

= $\boxed{5^{2k} + 3k - 1} + 3 + 24 · 5^{2k}$

= $9 + 3 + 24 . 5^{2k}$

$\underline{n = 1}$

$3 + 24 . 5^{(2k)} = 603$ ✓

$\underline{n = k}$

$3 + 24 . 5^{2k} = 9$

$\underline{n = k+1}$

= $3 + 24 . 5^{2(k+1)}$

= $3 + 24 . 25 . 5^{2k}$

= $\boxed{3 + 24 . 5^{2k}} + 24 . 24 . 5^{2k}$

= $9 + 3.8.3.8.5^{2k}$

$9(1 + 5^{2k})$ ✓