Conditions

4^3n times 4^n divided by 8^2n

Solution

Consider the following expression:

$$\frac{4^{3n}4^{n}}{8^{2n}}$$

To simplify this we must remember, that when we multiply, the powers are summing, when divide – they are subtracting.

So

$$4^{3n}4^{n} = 4^{3n+n} = 4^{4n}$$

As we know, 4=2*2, so:

$$4^{4n} = (2 \cdot 2)^{4n} = 2^{4n}2^{4n} = 2^{8n}$$

Also,

$$8^{2n} = (2 \cdot 2 \cdot 2)^{2n} = 2^{2n}2^{2n}2^{2n} = 2^{6n}$$

Now we are ready to complete the division:

$$\frac{2^{8n}}{2^{6n}} = 2^{8n-6n} = 2^{2n}$$

Answer: 2^{2n}