$$P= \left(m+n\right)^{2}-\left(m-n\right)^{2}+\left(m-2n\right)^{2}-\left(m\right)^{2}-4\left(n\right)^{2} $$

$$P=\left(m^{2}+2mn+n^{2}\right)-\left(m^{2}-2mn+n^{2}\right)+\left(m^{2}-4mn+4n^{2}\right)-\left(m\right)^{2}-4\left(n\right)^{2}$$

$$P=m^{2}+2mn+n^{2}-m^{2}+2mn-n^{2}+m^{2}-4mn+4n^{2}-m^{2}-4n^{2}$$

$$P=2mn+2mn-4mn$$

$$P=0$$