

Problem 2 WebAssign.

Use the binomial theorem to expand the following expression.

$$(u - 5v)^4$$

$$\begin{aligned}(u - 5v)^4 &= \sum_{k=0}^4 \binom{4}{k} u^{4-k} (-5v)^k && \text{by the binomial theorem} \\&= u^4 + \binom{4}{1} u^3 (-5v) + \binom{4}{2} u^2 (-5v)^2 + \binom{4}{3} u (-5v)^3 + (-5v)^4 \\&= u^4 + 4(-5)u^3v + 6(25)u^2v^2 + 4(-125)uv^3 + 625v^4 && \text{by algebra} \\&= u^4 - 20u^3v + 150u^2v^2 - 500uv^3 + 625v^4\end{aligned}$$