Answer on Question #60280 – Math – Algebra

Question

Factorize

$$27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$$

Solution

$27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p = \frac{1}{216}(3^3 6^3 p^3 - 1 - 3^2 2^{-1} 6^3 p^2 + 2^{-2} 6^3 p) =$

$= \frac{1}{216}(18^3 p^3 - 3 \cdot 18^2 p^2 + 3 \cdot 18p - 1) = \frac{1}{216}((18p)^3 - 3(18p)^2 + 3(18p) - 1) = \frac{1}{216}(18p - 1)^3.$

We applied the following formula:

$(a - b)^3 = a^3 - 3a^2 b + 3ab^2 - b^3,$

where $a = 18p$, $b = 1$.

Answer: $\frac{1}{216}(18p - 1)^3$.