

1. Evaluate $-3x^2 - 2xy + 4y^2 - xy^3$ for $x = 3$ and $y = -1$.

$$\begin{aligned} &= -3(\mathbf{3})^2 - 2(\mathbf{3})(\mathbf{-1}) + 4(\mathbf{-1})^2 - (\mathbf{3})(\mathbf{-1})^3 \\ &= -3(\mathbf{9}) - 2(\mathbf{-3}) + 4(\mathbf{1}) - 3(\mathbf{-1}) \\ &= -27 + 6 + 4 + 3 \\ &= -14 \end{aligned}$$

2. Simplify $\frac{100x^2y^5z^3}{-25xy^5z}$

$$\begin{aligned} &= -4x^{2-1}y^{5-5}z^{3-1} \\ &= -4x^1y^0z^2 \\ &= -4xz^2 \end{aligned}$$

3. Simplify $-2a(a + 3ab - b^2) + 6b(2a - ab + b)$

$$\begin{aligned} &= -2a^2 - 6a^2b + 2ab^2 + 12ab - 6ab^2 + 6b^2 \\ &= -2a^2 - 6a^2b - 4ab^2 + 12ab + 6b^2 \end{aligned}$$