

100

$$\begin{aligned}
 & [(\underline{2x+z^2})(\underline{x^3z-z^2}) : z+z^3] : x-2x(x^3+z) - z \cdot (x^2z-2-2x) = \\
 & = [(2x^4z-2xz^2+x^3z^3-z^4) \cdot \frac{1}{z+z^3}] : x-2x^4-2xz - x^2z^2+2z+2xz = \\
 & = [2x^4-2xz+x^3z^2-\cancel{z^3}+\cancel{z^3}] : x-2x^4-\cancel{2xz} - \cancel{x^2z^2}+2z+\cancel{2xz} = \\
 & = 2x^3-\cancel{2z}+\cancel{x^2z^2} - 2x^4-\cancel{x^2z^2}+\cancel{2z} = \\
 & = \boxed{2x^3-2x^4}
 \end{aligned}$$

101

$$\begin{aligned} & \{(x+y) [(x+y) + (x-y)] - 2xy\} : [(-2)(-x)^2] = \\ & = \{(x+y) [x + \cancel{y} + x - \cancel{y}] - 2xy\} : [-2x^2] = \\ & = \{(x+y) \underline{2x} - 2xy\} : [-2x^2] = \\ & = \{2x^2 + \cancel{2xy} - \cancel{2xy}\} : [-2x^2] = \\ & = 2x^2 : (-2x^2) = \textcircled{-1} \end{aligned}$$

102

$$\begin{aligned}
 & \left[\underline{(1-a)} \underline{(1+a+a^2)} (1+a^3) - 1 \right] : (-a^5) = \\
 & = \left[\underline{(1+a+a^2-a^3-a^4-a^5)} (1+a^3) - 1 \right] : (-a^5) = \\
 & = \left[\underline{(1-a^3)} \underline{(1+a^3)} - 1 \right] : (-a^5) = \\
 & = \left[\underline{(1+a^3-a^3-a^6)} - 1 \right] : (-a^5) = \\
 & = \left[\underline{1-a^6-1} \right] : (-a^5) = (-a^6) : (-a^5) = \underline{a} = \boxed{a}
 \end{aligned}$$

$$\begin{aligned}
& 103 \left\{ 2a^4 \left[\frac{1}{8}b + a \right] + 16a \left(\frac{1}{8}a - \frac{1}{16}b \right) : a^2 + a^2 \left(\frac{a^2 - 1b^2}{4} \right) \right\} \\
& = \left\{ 2a^4 \left[\frac{1}{8}b^2 + ab + 2a^2 - ab \right] : a^2 + \left(a^4 - \frac{1}{4}a^2b^2 \right) \right\} : (-5a^4) = \\
& = \left\{ 2a^4 \left[\frac{1}{8}b^2 + 2a^2 \right] : a^2 + a^4 - \frac{1}{4}a^2b^2 \right\} : (-5a^4) = \\
& = \left\{ \frac{1}{4}a^4b^2 + 4a^6 : a^2 + a^4 - \frac{1}{4}a^2b^2 \right\} : (-5a^4) = \\
& = \left\{ \frac{1}{4}a^4b^2 + 4a^6 + a^4 - \frac{1}{4}a^2b^2 \right\} : (-5a^4) = \\
& = 5a^4 : (-5a^4) = \boxed{-1}
\end{aligned}$$

$$\begin{aligned}
& \sqrt[104]{\left[\left(2m^2n^3 - \frac{1}{4}m^5 \right) \cdot (-8mn) + 2(1+2mn) \cdot (1-2mn+4m^2n^2) \right] : \frac{1}{2}} \\
&= \sqrt[104]{\left[-16m^3n^3 + 2m^5 + (2+4mn)(1-2mn+4m^2n^2) \right] : \frac{1}{2}} \\
&= \sqrt[104]{\left[-16m^3n^3 + 2m^5 + 2 - 4mn + 8m^2n^2 + 4mn - 8m^2n^2 + 16m^3n^3 \right] : \frac{1}{2}} \\
&= \sqrt[104]{\left[2m^5 + 2 \right] : \frac{1}{2}} = \left\{ m^5 + 1 \right\} : \frac{1}{2} = \left\{ m^5 + 1 \right\} \cdot 2 = \\
&= \boxed{2m^5 + 2}
\end{aligned}$$

$$\begin{aligned}
& (m^2 + m^2) \cdot [(1,5m - 0,6m)(0,6m + 1,5m) - 1,805mm] - (-m^2)^2 \\
&= (m^2 + m^2) \cdot \left[\left(\frac{15}{10}m - \frac{6}{10}m \right) \cdot \left(\frac{6}{10}m + \frac{15}{10}m \right) - \frac{1805 - 180}{100}mm \right] - m^4 = \\
&= (m^2 + m^2) \cdot \left[\left(\frac{3}{2}m - \frac{2}{5}m \right) \cdot \left(\frac{2}{5}m + \frac{3}{2}m \right) - \frac{1625 - 180}{100}mm \right] - m^4 = \\
&= (m^2 + m^2) \cdot \left[m^2 + \frac{9}{4}mm - \frac{4}{5}mm - m^2 - \frac{65}{36}mm \right] - m^4 = \\
&= (m^2 + m^2) \cdot \left[m^2 + \left(\frac{9}{4} - \frac{4}{5} - \frac{65}{36} \right)mm - m^2 \right] - m^4 = \\
&= (m^2 + m^2) \cdot \left[m^2 + \frac{81 - 16 - 65}{36}mm \right] - m^4 = \\
&= (m^2 + m^2) \cdot (m^2 - m^2) - m^4 = \\
&= \cancel{m^4} - \cancel{m^2}m^2 + \cancel{m^2}m^2 - m^4 - \cancel{m^4} = \boxed{-m^4}
\end{aligned}$$