(1) (A) $2^3\left(\frac{1}{2}\right)^{-3} = 2^3 \cdot (2^{-1})^{-3} = 2^3 \cdot 2^3 = \boxed{2^6 = 64}$

(B) $\frac{3^5}{81^{-2}} = 3^5 \cdot 81^2 = 3^5 \cdot (3^4)^2 = 3^5 \cdot 3^8 = \boxed{3^{13} = 1594323}$

(C) $\frac{625^{-1}(5)^2}{25^{-6}} = (5^4)^{-1}(5)^2 \cdot 25^6 = 5^{-4} \cdot 5^2 \cdot (5^2)^6 = 5^{-4} \cdot 5^2 \cdot 5^{12} = \boxed{5^{10} = 9,765,625}$

(D) $\frac{(4^{-3})^2(16)}{256^{-1}} = \frac{4^{-6} \cdot 4^2}{(4^4)^{-1}} = 4^{-6} \cdot 4^2 \cdot 4^{-4} = 4^{-8} = \boxed{\frac{1}{4^8} = \frac{1}{65536} = .000015}$

(2) (A) $(3^2)^{-2} M = \frac{1}{36^2}$

$3^{-4} M = 36^{-2}$

$3^{-4} M = (9 \cdot 4)^{-2}$

$3^{-4} M = (3^2 \cdot 2^2)^{-2}$

$3^{-4} M = 3^{-4} \cdot 2^{-4}$

$\boxed{M = 2^{-4} = \frac{1}{16}}$

(B) $\frac{5M}{125^{-2}} = 150$

$5 \cdot M \cdot 125^2 = 150$

$5 \cdot M \cdot (5^3)^2 = 25 \cdot 6$

$5 \cdot M \cdot 5^6 = 5^2 \cdot 6$

$5^7 \cdot M = 5^2 \cdot 6$

$5^5 M = 6$

$\boxed{M = \frac{6}{5^5} = \frac{6}{3125} = .00192}$

(C) $\frac{28}{M^{-3}} = (7^{-4})^{1/2} \cdot 56$

$28 \cdot M^3 = 7^{-2} \cdot 56$

$28 \cdot M^3 = 7^{-2} \cdot 28 \cdot 2$

$M^3 = 2 \cdot 7^{-2}$

$M^3 = \frac{2}{49}$

$\boxed{M = \sqrt[3]{\frac{2}{49}} = .344}$

(D) $\frac{\sqrt[3]{11^6}}{121^{-5}} = (11^9)^{1/3} M$

$11^{6/3} \cdot 121^5 = 11^{9/3} M$

$11^2 \cdot (11^2)^5 = 11^3 M$

$11^2 \cdot 11^{10} = 11^3 M$

$11^{12} = 11^3 M$

$\boxed{11^9 = M}$

$\boxed{2,357,947,691 = M}$

(3) (A) $\dfrac{\sqrt[3]{b^4 a^6}}{b^{-2/3} a^{-2}} = \dfrac{b^{4/3} \cdot a^{6/3}}{b^{-2/3} a^{-2}} = b^{4/3} a^2 \cdot b^{2/3} a^2 = b^{6/3} a^4 = \boxed{b^2 a^4}$

(B) $\dfrac{\sqrt[5]{625\, b^9}}{b^{-11/5}\, 14} = \dfrac{625^{1/5} \cdot b^{9/5}}{b^{-11/5}\, 14} = \dfrac{(5^4)^{1/5} \cdot b^{9/5}}{b^{-11/5}\, 14} = \dfrac{5^{4/5} \cdot b^{9/5} \cdot b^{11/5}}{14} = \dfrac{5^{4/5} \cdot b^{20/5}}{14}$

$= \dfrac{5^{4/5} \cdot b^2}{14}$

$\boxed{= \dfrac{5^{4/5}}{14} b^2 = .259\, b^2}$

(C) $\dfrac{\sqrt{12\, b^6 c^5}}{c^{-5/2}\, 6} = \dfrac{\sqrt{12}\, b^{6/2} c^{5/2}}{c^{-5/2}\, 6} = \dfrac{\sqrt{12}\, b^3 c^{5/2} \cdot c^{5/2}}{6}$

$= \dfrac{\sqrt{12}}{6} c^{10/2} b^3 = \dfrac{\sqrt{12}}{6} c^5 b^3$

$= \dfrac{\sqrt{4}\sqrt{3}}{6} c^5 b^3 = \dfrac{2}{6}\sqrt{3} c^5 b^3$

$\boxed{\dfrac{\sqrt{3}}{3} c^5 b^3 = .577\, c^5 b^3}$

(D) $\dfrac{\sqrt[3]{(30 \cdot 3)^6 b^8}}{b^{-11/3} 6^{-3}} = \dfrac{\sqrt[3]{27^6 b^8}}{b^{-11/3} 6^{-3}} = \dfrac{27^{6/3} \cdot b^{8/3}}{b^{-11/3} 6^{-3}} = (3^3)^2 b^{8/3} \cdot b^{11/3} 6^3$

$= 3^6 \cdot b^{19/3} 6^3$

$\boxed{= 3^6 \cdot 6^3 \cdot b^3}$

$= 3^6 \cdot (3 \cdot 2)^3 b^3$

$= 3^6 \cdot 3^3 \cdot 2^3 b^3$

$\boxed{= 3^9 \cdot 2^3 b^3}$

$\boxed{= 157464\, b^3}$