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1. Simplify the following, giving each answer in positive index form.

- (a) $(3^{14} \times 3^{-3})^2$ (b) $14^{-3} \times 14^{-3}$
 (c) $\frac{12^4}{9^4}$ (d) $(2^3)^5 \times (3^4 \times 2^3) \times 3^9 \times \left(\frac{1}{4}\right)^0$
 (e) $\frac{(7^{-2})^{-3}}{(7^2)^0 \times 7^{-10}}$ (f) $\frac{((2^{-1})^{-1})^{-1} \times 6^4}{2^9 \times 3^{10}}$
 (g) $\frac{2^6 \times 8^{-3}}{4^{-3} \times 2^7}$ (h) $\frac{6^{-7} \times 2^{-6}}{9^{-7}} \times \left(\frac{3}{4}\right)^{-6}$
 (i) $\frac{(15^{-4} \times 15^0 \times 15)^2}{(5^{-1})^8 \times 9^{-4}}$

2. Evaluate the following.

- (a) $\left(\frac{2}{5}\right)^3$ (b) 7^{-2}
 (c) $(0.04)^{-1}$ (d) $\left(1\frac{1}{4}\right)^{-3}$
 (e) $\frac{1}{\left(\frac{3}{2}\right)^{-2}}$ (f) -5^0
 (g) $-(2)^6$ (h) $(-8)^2$
 (i) -4^{-3} (j) $(-2)^{-6}$
 (k) $[(-3)^{-1}]^3$ (l) $[(2^0)^{-1}]^{\frac{1}{2}} \times (2^3)^{-1}$
 (m) $2^3 \times 3^{-3}$ (n) $2^3 + 2^4$
 (o) $\frac{(-2)^4}{-(2^3)^4}$ (p) $\left(\frac{4^2}{2^3}\right)^{-2}$
 (q) $1^3 + 2^3 + 3^3$ (r) $10^3 + 10^1 + 10^0 + 10^{-2}$

3. Evaluate the following.

- (a) $\frac{8^{-7}}{4^{-3} \times 4^{-4}}$ (b) $\frac{2^5 \times 3^5}{6^2}$
 (c) $\frac{12^3}{4^5 \times 3^2}$ (d) $\frac{4^2 \times 2^{-3}}{3^{-3} \times 6^2}$
 (e) $\frac{(-3)^3 \times (-3)^{-6}}{(-2)^{-3}}$ (f) $\frac{2^7 \times 5^8 \times 2}{10^7}$
 (g) $\frac{2^4 + 3^4}{5^3 - 5^2}$ (h) $2^{-4} + \left(\frac{1}{3}\right)^{-1}$
 (i) $\left(\frac{1}{2}\right)^3 + 4^{-1} + \left(\frac{2}{3}\right)^{-2}$ (j) $\frac{(10^{11} \times 10^{-3})^2}{5^{17} \times 2^{17}}$