Power of a Power	Repeated Multiplication	Product of Factors	Power Form
$(2^4)^3$	$2^4 \times 2^4 \times 2^4$	$(2\times2\times2\times2)\times(2\times2\times2\times2)\times(2\times2\times2\times2)$	2^{12}
$(3^2)^4$	$3^2 \times 3^2 \times 3^2 \times 3^2$	$(3\times3)\cdot(3\times3)\cdot(3\times3)(3\times3)$	3^8
$(4^2)^3$			4^6
$(5^3)^3$	-		5^9
$[(-4)^3]^2$			$(-4)^6$
$[(-5)^3]^5$			$(-5)^{15}$

RULE: to raise a power to a power you multiply the exponents

$(6^2)^7 = 6^{14}$

$-(2^4)^5$

-2^{20}

$[(-7)^3]^2$

$(-7)^6$

Power	Repeated Multiplication	Product of Factors	Product of Powers
$(2 \times 5)^3$	$(2 \times 5) \times (2 \times 5) \times (2 \times 5)$	$2 \times 2 \times 2 \times 5 \times 5 \times 5$	$2^3 \times 5^3$
$(3 \times 4)^2$			$3^2 \times 4^2$
$(4 \times 2)^5$			$4^5 \times 2^5$
$(5 \times 3)^4$			$5^4 \times 3^4$
$(5 \times 6)^2$			$5^2 \times 6^2$
$[7 \times (-2)]^3$			$7^3 \times (-2)^3$

→ multiply

RULE: $(a \cdot b)^m = a^m \cdot b^m$

IF the base is a product (2 #s multiplied)
then you can apply the exponent to each #

$[(-7) \times 5]^2$

$(-7)^2 \times 5^2$

$-(3 \times 2)^2$

$-3^2 \times 2^2$

Power	Repeated Multiplication	Product of Factors	Product of Quotients
$\left(\frac{5}{6}\right)^3$	$\frac{5}{6} \times \frac{5}{6} \times \frac{5}{6}$	$\frac{5 \times 5 \times 5}{6 \times 6 \times 6}$	$\frac{5^3}{6^3}$
$\left(\frac{2}{3}\right)^4$			$\frac{2^4}{3^4}$
$\left(\frac{1}{5}\right)^5$			$\frac{1^5}{5^5}$
$\left(\frac{3}{10}\right)^2$			$\frac{3^2}{10^2}$
$\left(\frac{-4}{7}\right)^3$			$\frac{(-4)^3}{7^3}$
$\left(\frac{-4}{-5}\right)^6$			$\frac{(-4)^6}{(-5)^6}$

$$(8 \div 9)^5 = 8^5 \div 9^5$$

$$\left(\frac{8}{9}\right)^5 = \frac{8^5}{9^5}$$

$[24 \div (-6)]^4$

① $24^4 \div (-6)^4$

$331\,776 \div 1296$

256 ✓

② $(-4)^4$

$= 256$ ✓

$\left(\frac{78}{12}\right)^3$

$\frac{78^3}{12^3} = \frac{474552}{1728}$

≈ 274.6

Rule: $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

$(3^2 \times 3^3)^3 - (4^3 \times 4^2)^2$

$(3^{2+3})^3 - (4^{3+2})^2$

$(3^5)^3 - (4^5)^2$

$3^{5 \cdot 3} - 4^{5 \cdot 2}$

$3^{15} - 4^{10}$

$14348907 - 1048576$

13300331

$(6 \times 7)^2 + (3^8 \div 3^6)^3$

$6^2 \cdot 7^2 + (3^{8-6})^3$

$6^2 \cdot 7^2 + (3^2)^3$

$6^2 \cdot 7^2 + 3^6$

$36 \cdot 49 + 729$

$1764 + 729$

2493 ✓

$$[(-5)^3 + (-5)^4]^0$$

Practice P. 84,85 # 4cd, 5cd, 6, 8ace, 11, 14aceg, 15, 17ace, 19de