M9 - 3.1 - Add/Subract Exponent Laws HW

Write each product as a repeated multiplication then as a single exponent (power).

$3^2 \times 3^3 = (3 \times 3) \times (3 \times 3 \times 3) = 3^5$

$5^3 \times 5^2 =$

$2^3 \times 2^2 =$

$7^3 \times 7^4 =$

$9^4 \times 9^5 =$

Write each product as a single exponent (power). Show your work!. Without Brackets.

$3^2 \times 3^3 = 3^{2+3} = 3^5$

$7^3 \times 7^4 =$

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

$5^3 \times 5^4 =$

$3^7 \times 3^2 =$

$(-4)^3 \times (-4)^5 =$

$4^7 \times 4^2 =$

$8^2 \times 8 =$

$(-2)^3 \times (-2)^5 =$

Write each quotient as a repeated multiplication in fraction form then as a single power (exponent).

$3^4 \div 3^2 = \frac{3 \times 3 \times 3 \times 3}{3 \times 3} = 3^2$

$3^5 \div 3^3 =$

$4^4 \div 4^2 =$

$6^2 \div 6^2 =$

$2^3 \div 2^2 =$

$(-4)^3 \div (-4) =$

Write each quotient of powers as a single power (exponent). Show your work.

$3^4 \div 3^2 = 3^{4-2} = 3^2$

$2^4 \div 2^2 =$

$(-2)^6 \div (-2)^3 =$

$4^7 \div 4^4 =$

$8^6 \div 8^4 =$

$(-3)^5 \div (-3)^3 =$

$\frac{3^5}{3^2} =$

$\frac{8^4}{8^2} =$

$\frac{5^3}{5^2} =$

$\frac{6^5}{6^2} =$

$\frac{4^2}{4} =$

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

M9 - 3.2 - Multiply Exponent Laws HW

Write each product as a repeated multiplication then as a single exponent (power).

$(3^3)^2 = (3 \times 3 \times 3)^2 = (3 \times 3 \times 3) \times (3 \times 3 \times 3) = 3^6$

$(5^2)^3 =$

$(7^3)^2 =$

Write the following as a single power (exponent). Show your work.

$(4^3)^2 = 4^{3\times2} = 4^6$

$(2^2)^3 =$

$(5^2)^2 =$

$(8^2)^5 =$

$(7^3)^4 =$

$(9^5)^2 =$

Write as a multiplication of two powers.

$[7 \times 2]^2 = 7^2 2^2$

$[3 \times 2]^2 =$

$[5 \times 3]^2 =$

$(6 \times 7)^3 =$

Write the following as a single power.

$(7 \times 2)^2 = 14^2$

$[3 \times 2]^2 =$

$[5 \times 3]^2 =$

$(6 \times 7)^3 =$

Write as a division of two powers.

$\left(\frac{3}{5}\right)^3 =$

$\left(\frac{5}{7}\right)^2 =$

$\left(\frac{9}{4}\right)^2 =$

$\left(\frac{1}{2}\right)^2 =$

Multiply the exponents.

$[7x]^2 = 7^2x^2$

$[3x]^2 =$

$[5x^3]^2 =$

$2[3x^4]^2 =$

M9 - 3.3 - Multiplication-Exponential Form (+/-) HW

Write the following in exponential form, then evaluate if possible.

$2 \times 2 \times 2 \times 2 \times 2 = 2^5 = 32$

$4 \times 4 \times 4 =$

$5 \times 5 =$

$3 \times 3 \times 3 \times 3 =$

$1 \times 1 \times 1 \times 1 =$

$9 \times 9 =$

$6 \times 6 \times 6 =$

$x \times x =$

$a \times a \times a =$

$5 = 5^1 = 5$

$6 =$

$(3)(3)(3) = (3)^3 = 27$

$(5)(5)(5) =$

$(x)(x) =$

$-2 \times -2 \times -2 = (-2)^3 = -8$

$-3 \times -3 \times -3 =$

$-5 \times -5 =$

$-6 \times -6 =$

$-5 \times -5 \times -5 \times -5 =$

$-6 \times -6 \times -6 \times -6 =$

$(-2) \times (-2) \times (-2) = (-2)^3 = -8$

$(-2) \times (-2) \times (-2) \times (-2) =$

$(-m) \times (-m) \times (-m) =$

$(-a)(-a) =$

$-4 \times 4 \times 4 = -4^3 = -64$

$-5 \times 5 =$

$-9 \times 9 \times 9 \times 9 =$

$-(-2) \times (-2) \times (-2) = -(-2)^3 = 8$

$-(-2) \times (-2) \times (-2) \times (-2) =$

$-(-3)(-3) =$

M9 - 3.3 - Exponential-Multiplication Form (+/-) HW

Write as a repeated multiplication, then evaluate.

$4^2 = 4 \times 4 = 16$

$2^3 =$

$3^2 =$

$2^5 =$

$3^3 =$

$2^4 =$

$2^2 =$

$5^4 =$

$4^4 =$

$3^4 =$

$-3^4 = -3 \times 3 \times 3 \times 3 = -81$

$-5^2 =$

$(-2)^4 = (-2)(-2)(-2)(-2) = 16$

$(-2)^2 =$

$(-1)^4 =$

$(-5)^3 =$

$(-2)^3 =$

$-(3)^4 = -(3)(3)(3)(3) = -81$

$-(1)^3 =$

$-(2)^2 =$

$-(2)^3 =$

State whether Positive or Negative

$-4^{even} = +$

$-3^{odd} =$

$(-3)^{odd} =$

$(-6)^{even} =$

$-(-2)^{odd} =$

$-(-5)^{even} =$

$(-2^3) = (-2 \times 2 \times 2) = -8$

$(-2^4) =$

$-(-1)^4 = -(-1)(-1)(-1)(-1) = -1$

$-(-2)^3 =$

$-(-3)^3 =$

$-(-5)^4 =$

M9 - 3.3 - Perfect Change of Base HW

Write in squared exponential form.

$4 = 2^2$

$49 =$

$169 =$

$36 =$

$9 =$

$144 =$

$100 =$

$121 =$

$196 =$

$25 =$

$225 =$

$400 =$

Write in cubed exponential form.

$27 = 3^3$

$64 =$

$512 =$

$8 =$

$343 =$

$1 =$

$125 =$

$216 =$

$729 =$

$1000 =$

Write to 4th power in exponential form.

$1 = 1^4$

$81 =$

$1296 =$

$625 =$

$256 =$

$2401 =$

$10000 =$

$16 =$

$6561 =$

Write with different bases in exponential form.

$16 = 2^4$

$64 =$

$81 =$

$256 =$

$4096 =$

$16 = 4^2$

$64 =$

$81 =$

$256 =$

$4096 =$

$256 =$

$4096 =$

$4096 =$

M9 - 3.3 - Imperfect Change of Base HW

Change to Exponential Form with Lowest Bases

$12 = 3 \times 2^2$

$18 =$

$20 =$

$24 =$

$28 =$

$32 =$

$40 =$

$44 =$

$45 =$

$48 =$

$50 =$

$52 =$

$54 =$

$56 =$

$60 =$

$63 =$

$68 =$

$72 =$

$75 =$

$76 =$

$76 =$

$80 =$

$84 =$

$88 =$

$90 =$

$96 =$

$98 =$

$108 =$

$128 =$

$135 =$

$162 =$

$189 =$

$192 =$

M9 - 3.3 - Lowest Base Change of Base HW

Change to Exponential Form with Lowest Bases

$16^4 =$

$(16)^4$

$(2^4)^4$

2^{16}

$25^2 =$

$169^3 =$

$125^4 =$

$64^2 =$

$16^4 =$

625^2

$1024^2 =$

$81^3 =$

$27^3 =$

$49^5 =$

$243^2 =$

18^2

$(3^2 \times 2^1)^2$

$3^4 \times 2^2$

$12^3 =$

$100^3 =$

$72^2 =$

$60^3 =$

$36^5 =$

$108^3 =$

$76^2 =$

$128^4 =$

M9 - 3.4 - Negative Exponents HW

Write with positive exponents

$2^{-3} = \frac{1}{2^3}$

$2^{-3} = 0.125 = \frac{1}{2^3}$ ✓

Check Answer

$3^{-4} =$

$6^{-2} =$

$5^{-2} =$

$9^{-2} =$

$3^{-3} =$

$\frac{1}{2^{-3}} =$

$\frac{1}{7^{-2}} =$

$\frac{1}{4^{-1}} =$

$\frac{1}{3^{-4}} =$

$\frac{1}{8^{-5}} =$

$\frac{1}{6^{-9}} =$

$2x^{-2} =$

$\frac{1}{2x^{-2}} =$

$2^{-3}x =$

$\frac{1}{2^{-3}x} =$

$2^{-3}x^{-2} =$

$\frac{1}{2^{-3}x^{-2}} =$

$\frac{5}{2y^{-3}} =$

$\frac{x^2}{y^{-3}} =$

$\frac{5}{3^{-2}y^{-3}} =$

$\frac{x^{-2}}{y^{-3}} =$

$\frac{4}{(2x)^{-2}} =$

$\frac{a^{-2}}{(2y)^{-4}}$

Write with negative exponents

$2^3 =$

$\frac{1}{2^3} =$

$\frac{1}{2x^3} =$

$\frac{2}{x^3} =$

M9 - 3.4 - Negative Exponents HW

Write with Negative exponents

$\frac{6^2}{6^4} =$

$\frac{9^2}{9^3} =$

$5^4 \div 5^5 =$

$\frac{7}{7^2} =$

$\frac{7}{7^2} =$

$2^2 \div 2^5 =$

Write with Positive exponents

$\frac{6^2}{6^4} =$

$\frac{9^2}{9^3} =$

$5^4 \div 5^5 =$

$\frac{7}{7^2} =$

$\frac{7}{7^2} =$

$2^2 \div 2^5 =$

Write with Positive exponents

$\left(\frac{2}{3}\right)^{-2} =$

$\left(\frac{5}{7}\right)^{-4} =$

$\left(\frac{1}{2}\right)^{-3} =$

Write with Positive exponents

$\frac{5^{-3}}{5^2} =$

$\frac{6^2}{6^{-1}} =$

$8^3 \div 8^{-4} =$

$\frac{9^{-4}}{9^{-3}} =$

$\frac{4}{4^2} =$

$7^{-2} \div 7^{-5} =$

Write with Positive exponents

$\frac{2x^{-2}}{y^{-4}} =$

$\frac{5x^2}{y^{-4}} =$

$\frac{5x^{-2}}{2y^4} =$

$\frac{4a^{-3}}{b^{-4}} =$

$\frac{a^{-2}}{5b^{-5}} =$

$\frac{(6a)^{-2}}{b^5} =$

M9 - 3.4 - Change of Base Negative Exponents HW

Change to positive exponents with lowest base.

$8^{-2}=$

$\frac{1}{8^2}$ Write with Positive Exponents

$\frac{1}{(2^3)^2}$ Change of Base

$\frac{1}{2^6}$ Multiply Exponents

OR

$8^{-2}=$

$(2^3)^{-2}$ Change of Base

2^{-6} Multiply Exponents

$\frac{1}{2^6}$ Write with Positive Exponents

$8^{-2} = 0.015625 = \frac{1}{2^6}$ ✓ Check Answer

Change to negative exponents with lowest base.

$\frac{1}{2}=$

$\frac{1}{2^1}$ Change of Base

2^{-1} Multiply Exponents

Negative Laws $\frac{1}{2^1} = 2^{-1}$

$\frac{1}{81}=$

$\frac{1}{3^4}$ Change of Base

3^{-4} Negative Laws

Multiply Exponents

Write with Positive Exponents

$\frac{1}{9} = \frac{1}{3^2} = 3^{-2}$

$\left(\frac{1}{25}\right)^2 =$

$\left(\frac{1}{5^2}\right)^2$ Change of Base

$(5^{-2})^2$ Negative Laws

5^{-4} Multiply Exponents

OR

$\left(\frac{1}{25}\right)^2 =$

$\frac{1^2}{25^2}$ Multiply Exponents

$\frac{1}{(5^2)^2}$ Change of Base

$\frac{1}{5^4}$ Multiply Exponents Again

5^{-4} Negative Laws

Change to positive exponents with lowest base.

$27^{-2} =$

$25^{-2} =$

$64^{-1} =$

$16^{-3} =$

$4^{-3} =$

$243^{-2} =$

Change to negative exponents with lowest base.

$\left(\frac{1}{9}\right)^3 =$

$\left(\frac{1}{2}\right)^{-4} =$

$\left(\frac{4}{9}\right)^{-3}$

M9 - 3.5 - Combo Exponents Laws HW

Simplify

$\frac{2^3 \times 2^5}{2^2} =$

$\frac{4^8 \times 2^5}{32} =$

$\frac{8^3 \times 2^{10}}{256 \times 4^2} =$

$\frac{2^8 \times 2^{-3}}{16} =$

$\frac{8^{-1} \times 32^4}{64^{-2}} =$

$\frac{2^{-1} \times 16^{-4}}{128^{-2}} =$

Simplify

$\frac{(6x^5y^2)(5xy^3)}{(2x^4y^2)} =$

$\frac{(6x^5y^3)^{-3}(4x^2y^4)^3}{(2x^3y)^{-2}} =$

M9 - 3.6 - Exponents Negative Brackets Notes HW

Simplify without Brackets

$(-3x^2)^2 =$

$(-4x^{-3})^3 =$

$(-7x^2)^{-2} =$

$(-5x^3)^3 =$

$-(-4x^2)^4 =$

$-2(-5x^2)^{-3} =$

Simplify without Brackets

$\left(\frac{4x^3}{2x^2}\right)^5 =$

$\left(\frac{2x^5}{7x^6}\right)^2 =$

$\left(\frac{1x^4}{2x^3}\right)^{-2} =$

$\left(\frac{8x^4}{2x^2}\right)^5 =$

$\left(\frac{3x^5}{5x^{-2}}\right)^3 =$

$\left(\frac{3x^{-4}}{2x^3}\right)^{-2} =$