

HOMEWORK: MATH INTERLUDES IV – EXPONENTS & LIKE TERMS

Remember – neatness and completeness count. Also, you must show your work. The correct result without a sufficient amount of correct and appropriate work is worth zero points. Please include this assignment in your Math Interludes Notebook.

(Numbers 1 through 3 are from PreAlgebra Problem Solving 2nd Ed., The Consortium for Foundation Mathematics)

- 1) The distance from Earth to Alnilam, the center star in Orion's Belt, is 10^{16} miles. Write this distance as a whole number.

- 2) The distance from Earth to the Large Magellanic Cloud, a satellite galaxy of the Milky Way, is 10,000,000,000,000,000 miles. Write this distance in exponential form.

- 3) Not too long ago, computers came with 512, 256, 128, or even 64 MB of RAM. Write each of these numbers as a power of 2. (Hint: just keep multiplying $2 \cdot 2 \cdot 2 \dots$ until you get the number you're looking for and then count the number of 2s you multiplied together. That count will be the exponent. For example, $2 \cdot 2 \cdot 2 = 8$, and since I multiplied three 2s together, I know $8 = 2^3$.)

- 4) In 1981, Bill Gates said that 640 kilobytes (K) of RAM should be enough for anybody. One megabyte (MG) is equivalent to 1024 K, and one gigabyte (GB) is equivalent to 1024 megabytes.
 - a) Typically, we say that there are 1,000,000 kilobytes in one gigabyte. How many kilobytes are actually in one gigabyte? Show your work.

 - b) Write the number you found in part a) as a power of 2.

5) Evaluate each of the following (do not round).

a) 5^4

b) 9^0

c) 1.5^3

d) 2.7^0

6) Express each of the following numbers in scientific notation.

a) 12,300,000

b) 0.000000985

c) 0.01

d) 10,000

7) If possible, write each expression using a single exponent.

a) $7^3 \cdot 7^7$

b) $5w^3 \cdot w^8$

c) $9^8 \cdot 9$

d) $x^4 \cdot y^5$

e) $cm \cdot cm \cdot cm$

f) $mi \cdot mi^2$

8) Combine like terms to simplify each of the following.

a) $5ab^2 + 11ab^2 - 2ab^2$

b) $9ft^2 - 5ft^2$

c) $-6x^3z + 4 + 8x^3z - 9$

d) $15in^2 - 15in$

e) $4w^2 \cdot w^3 + 4w^4 \cdot 3w$

f) $-3in \cdot 2in^2 + 8in^3$

Math Interludes IV Homework:

1) 10,000,000,000,000,000

4b) 2^{20}

6a) 1.23×10^7

7a) 7^{10}

7e) cm^3

8d) $15 \text{ in}^2 - 15 \text{ in}$

5a) 625

6b) 9.85×10^{-7}

7b) $5w^{11}$

7f) mi^3

8e) $16w^5$

2) 10^{19}

5b) 1

6c) 1×10^{-2}

7c) 9^9

8a) $14ab^2$

8f) 2 in^3

3) $2^9, 2^8, 2^7, 2^6$

5c) 3.375

6a) 1×10^4

7d) Bases are different – not possible.

8b) 4 ft^2

4a) 1,048,576

5d) 1

8) $2x^3z - 5$