

## Assignment #28: Distribution and Exponent Rules

Example:

$$\begin{aligned} & 3x^2y(3x^2+2yp^5-y^2z) \\ &= 3x^2y \cdot 3x^2 + 3x^2y \cdot 2yp^5 + 3x^2y \cdot -y^2z \\ &= 9x^4y + 6x^2y^2p^5 + -3x^2y^3z \end{aligned}$$

### Problems

1. a. Construct a 3 by 3 "magic square" of integers (not all equal) where each of the rows, columns, and long diagonals add up to 39. In other words, fill in this square for **a** through **i** so that the rows, columns, and long diagonals add up to 39.

a	b	c
d	e	f
g	h	i

- b. Construct a 3 by 3 "magic square" of integers (not all equal) from the following three numbers. Note: the sum is not 39.

	91	17
23		

Simplify.

2.  $4x^2y^8z^4 \cdot 2x^3y^4z^2$

3.  $9x^2p \cdot -9p^9y^2z$

Multiply.

4.  $2x^2y^2(z^3 + x^3y^6 + xz)$

5.  $2xy(-3x^4 + yz^2 + y^6z)$

6.  $-2x^9y^3(z^7x^3 - y^3z^5)$

7.  $-x^3y^3(z^2x^4 - y^7z^5)$

(R): Prove that any two-digit number "xy" is divisible by 7 if  $x-2y$  is divisible by 7.

Example: Prove that any two-digit number "xy" is divisible by 7 if  $x+5y$  is divisible by 7. Proof: if  $x + 5y$  is divisible by 7, then  $x + 5y = 7m$  for some integer  $m$ . So  $x = 7m - 5y$ . So  $10x + y = 10(7m - 5y) + y$  which is  $70m - 49y$ . So therefore  $10x+y$  is divisible by 7. Q.E.D.

(L): The Kool Klub has 14 members, 6 men and 8 women. How many ways could you choose 3 officers (President, Vice President, and Treasurer) so that the President is a woman and the Vice president is a man?