Name ___KEY___

1. Factor completely. You may need one of these formulas:

$$a^2 - b^2 = (a+b)(a-b)$$
$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$
$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

a. $x^2 - 4$

$(x-2)(x+2)$

b. $x^2y^2 - 1$

$(xy+1)(xy-1)$

c. $49y^2 + 1$

prime

d. $n^4 - r^6$

$(n^2 - r^3)(n^2 + r^3)$

e. $27y^3 - 1$

$(3y-1)(9y^2 + 3y + 1)$

f. $a^3b^3 - 8$

$(ab-2)(a^2b^2 + 2ab + 4)$

j. $121m^2 - 100n^2$

$(11m + 10n)(11m - 10n)$

k. $x^2 - \frac{1}{4}$

$(x + \frac{1}{2})(x - \frac{1}{2})$

l. $m^4 - 1$

$(m^2 + 1)(m^2 - 1)$
$(m^2 + 1)(m-1)(m+1)$

m. $x^3 + 125$

$(x+5)(x^2 - 5x + 25)$

n. $5k^3 + 40$

$5(k^3 + 8)$
$5(k+2)(k^2 - 2k + 4)$

o. $24x^3 - 81y^3$

$3(8x^3 - 27y^3)$
$3(2x - 3y)(4x^2 + 6xy + 9y^2)$

g. $x^2 - 225y^2$

$(x - 15y)(x + 15y)$

p. $9xy^2 - 4x$

$x(9y^2 - 4)$

$x(3y - 2)(3y + 2)$

h. $a^3b^6 - c^9$

$(ab^2 - c^3)(a^2b^4 + ab^2c^3 + c^6)$

q. $49 - \frac{9}{25}m^2$

$(7 - \frac{3}{5}m)(7 + \frac{3}{5}m)$

i. $x^6 - 81x^2$

$x^2(x^4 - 81)$

$x^2(x^2 - 9)(x^2 + 9)$

$x^2(x - 3)(x + 3)(x^2 + 9)$

r. $s^3 + 343$

$(s + 7)(s^2 - 7s + 49)$

s. $x^8 - 256$

$(x^4 + 16)(x^4 - 16)$

$(x^4 + 16)(x^2 + 4)(x^2 - 4)$

$(x^4 + 16)(x^2 + 4)(x + 2)(x - 2)$

Table of Common Squares and Cubes

Squares			Cubes	
$1^2 = 1$	$8^2 = 64$	$15^2 = 225$	$1^3 = 1$	$8^3 = 512$
$2^2 = 4$	$9^2 = 81$	$16^2 = 256$	$2^3 = 8$	$9^3 = 729$
$3^2 = 9$	$10^2 = 100$	$20^2 = 400$	$3^3 = 27$	$10^3 = 1000$
$4^2 = 16$	$11^2 = 121$	$25^2 = 625$	$4^3 = 64$	
$5^2 = 25$	$12^2 = 144$		$5^3 = 125$	
$6^2 = 36$	$13^2 = 169$		$6^3 = 216$	
$7^2 = 49$	$14^2 = 196$		$7^3 = 343$	