

2.3 Notes – Factoring Special Cases

A) Fill out the table below using the following steps:

Row 1: Write numbers 1-15

Row 2: Square the numbers from row 1

Row 3: Cube the numbers from row 1

Row 1	Natural Numbers														
Row 2	Perfect Squares														
Row 3	Perfect Cubes														

B) 1. $2^3 = \underline{\quad}$ 2. $(-2)^3 = \underline{\quad}$ 3. $x^3 = \underline{\quad}$ 4. $(-x)^3 = \underline{\quad}$ 5. $2x^2 = \underline{\quad}$ 6. $(-2x)^2 = \underline{\quad}$

C) In the box below put a **circle** around the perfect **cubes** and a **square** around the perfect **squares**.

8	$\frac{2}{3}$	25	$\frac{1}{8}$	4
$\frac{1}{4}$		-121		216
$12x^3$			10	-0.3
	$64x^6$	49		$27x^9$
-2		225		-343

D) Multiply the following. Which one is **not** a perfect square?

1. $(x-5)(x+5)$	2. $(x+2)(x+2)$	3. $(2x-3)(2x+3)$
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E) Answer the following questions as a class.

1) If $a^2 - b^2 = 2^2 - 3^2$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	2) If $a^2 - b^2 = 4 - 9$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	3) If $a^2 - b^2 = x^2 - 25$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?
4) If $a^2 - b^2 = (2x)^2 - (3y)^2$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	5) If $a^2 - b^2 = 4x^2 - 9y^2$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	6) If $a^2 - b^2 = -64c^2 + d^2$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?

F) Sum of Squares:

Difference of Squares:

G) Answer the following questions as a class.

1) If $a^3 + b^3 = 2^3 + 3^3$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	2) If $a^3 + b^3 = 8 + 27$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	3) If $a^3 - b^3 = x^3 - 4^3$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?
4) If $a^3 - b^3 = x^3 - 64$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	5) If $a^3 + b^3 = (2x)^3 + (3y)^3$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	6) If $a^3 + b^3 = 8x^3 + 27y^3$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?
7)) If $a^3 + b^3 = 125 + 8x^3$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	8) If $a^3 - b^3 = y^6 - 216$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?	9) If $a^3 - b^3 = -64c^3 - d^3$ then $a = \underline{\quad}$ and $b = \underline{\quad}$?

H) Sum of Cubes:

Difference of Cubes:



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I) Examples:

1) $1 - 9x^2$	2) $16x^2 + 25$	3) $16x^2 - 25$	4) $-100x^2 + 36$
5) $1 - x^3$	6) $m^3 + 8$	7) $343 - 125x^3$	8) $27a^3 + 8$
9) $-125u^3 + 64$	10) $27x^4 + 8x$	11) $343t^3 - u^3$	12) $-27a^6 - y^6$