Name: Key Block: _____ Date: _____

Cubes and Cube Roots

1. Without a calculator, find:

a. 7^3 343	b. 1^3 1	c. 4^3 64	d. 3^3 27
e. 10^3 1000	f. 5^3 125	g. 2^3 8	h. 6^3 216

2. Use prime factorization to determine the following cube roots.

a. $\sqrt[3]{512}$

2 | 512
2 | 256
2 | 128
2 | 64
2 | 32
2 | 16
2 | 8
2 | 4
2 | 2
1

$\sqrt[3]{512} = \sqrt[3]{8 \cdot 8 \cdot 8}$

$= \boxed{8}$

b. $\sqrt[3]{729}$

3 | 729
3 | 243
3 | 81
3 | 27
3 | 9
3 | 3
1

$\sqrt[3]{729} = \sqrt[3]{9 \cdot 9 \cdot 9}$

$= \boxed{9}$

c. $\sqrt[3]{1728}$

2 | 1728
2 | 864
2 | 432
2 | 216
2 | 108
2 | 54
3 | 27
3 | 9
3 | 3
1

$\sqrt[3]{1728} = \sqrt[3]{12 \cdot 12 \cdot 12}$

$= \boxed{12}$

d. $\sqrt[3]{2744}$

2 | 2744
2 | 1372
2 | 686
7 | 343
7 | 49
7 | 7
1

$\sqrt[3]{2744} = \sqrt[3]{14 \cdot 14 \cdot 14}$

$= \boxed{14}$

e. $\sqrt[3]{3375}$

5 | 3375
5 | 675
5 | 135
3 | 27
3 | 9
3 | 3
1

$\sqrt[3]{3375} = \sqrt[3]{15 \cdot 15 \cdot 15}$

$= \boxed{15}$

f. $\sqrt[3]{4096}$

2 | 4096
2 | 2048
2 | 1024
2 | 512
2 | 256
2 | 128
2 | 64
2 | 32
2 | 16
2 | 8
2 | 4
2 | 2
1

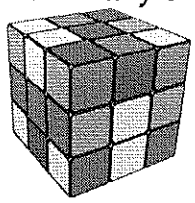
$\sqrt[3]{4096} = \sqrt[3]{16 \cdot 16 \cdot 16}$

$= \boxed{16}$

Name: _____ Block: _____ Date: _____

Calculators are allowed for the following questions.

3. How many small cubes are found in the 3x3 Rubik's cube pictured below?



$3^3 =$ 27 small cubes

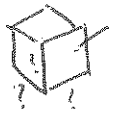
4. A rectangular swimming pool measures 8 feet wide, 16 feet long, and 4 feet deep. What are the dimensions of a cube shaped swimming pool that holds the same amount of water?

Volume = $l \times w \times h$
$= 8 \times 16 \times 4$
$= 512$

Side length = $\sqrt[3]{512}$
$=$ 8 ft

5. A cube shaped water reservoir holds 400 m^3 of water. How deep is it? Answer to the nearest tenth.

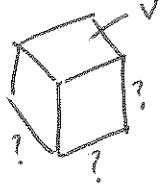
Depth = $\sqrt[3]{400}$ = 7.4 m



6. If a cubical block contains 21 952 in^3, how many square inches of paper will be required to cover the entire surface? (Remember, a cube has six sides)

Side length = $\sqrt[3]{21952}$
$= 28$ in

Surface Area = $6(28 \times 28)$
$=$ 4704 in^2



7. The entire surface area of a cubic block is 384 cm^2. How many 1 centimetre cubes can be cut from the block?

Area of one side = $\frac{384}{6}$
$= 64 cm^2$

Side length = $\sqrt{64}$
$= 8$ cm

Number of 1cm x 1cm x 1cm blocks = 8^3
$=$ 512