

1st May 2013  
Problem 1  
Solution by Adi Cox.

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Emilio Carraro  
12:31 PM -  
Hello.  
Find two 3-digit numbers A and B such that

$$a^3 + b^3 + c^3 = B, \quad x^3 + y^3 + z^3 = A$$

$$\text{where } A = 100a + 10b + c \quad \text{and} \quad B = 100x + 10y + z$$

---

Where  $a=2, b=4, c=4,$   
 $x=1, y=3, z=6,$

A=244  
B=136

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```
<!DOCTYPE HTML PUBLIC " - //W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd"
">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<title>A for loop</title>
</head>
<body>
<script type="text/javascript" language="javascript">

document.write("<h3>The 3 digit base 8 numbers = 5<h3>")

u=0;
v=9

for (a = u; a <= v; a++)
{
    for (b = u; b <= v; b++)
    {
        for (c = u; c <= v; c++)
        {
            {
if( ((a*a*a + b*b*b + c*c*c)>99)&&((a*a*a + b*b*b + c*c*c)<1000))
document.write(a,b,c, " = ", a*a*a + b*b*b + c*c*c, "<br />");
            }
        }
    }
}

</script>
</body>
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005 = 125  
006 = 216  
007 = 343  
008 = 512  
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963 = 972

We have 717 3 digit answers above.

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This is the best answer I have found:

$$2^3 + 4^3 + 4^3 = 136$$

$$1^3 + 3^3 + 6^3 = 244$$

4 solutions below where  $A = B$

$$1^3 + 5^3 + 3^3 = 153$$

$$1^3 + 5^3 + 3^3 = 153$$

$$3^3 + 7^3 + 0^3 = 370$$

$$3^3 + 7^3 + 0^3 = 370$$

$$3^3 + 7^3 + 1^3 = 371$$

$$3^3 + 7^3 + 1^3 = 371$$

$$4^3 + 0^3 + 7^3 = 370$$

$$4^3 + 0^3 + 7^3 = 370$$

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Thomas Andrews 5:56 PM

There are four solutions where  $A=B$ , and exactly one solution with  $A<B$ , but I only solved that brute force.?

Emilio Carraro 6:03 PM

Ok +Thomas Andrews! brute force always works! ;)

What is the solution with  $A<B$ ?