

## The 4 x 4 Magic Square by Adi Cox

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To find the value that a line equals in a 4x4 magic square with numbers from 1 to 16 we add those numbers from 1 to 16 then divide the answer by 4.

$$1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16=136$$
$$136/4=34$$

4	14	15	1
9	7	6	12
5	11	10	8
16	2	3	13

The html file that finds the 4 partition that adds up to 34:

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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>An Investigation Of 4 Partitions<h3>")

for (a = 1; a <= 34; a++)
{
    for (b = 1; b <= 34; b++)
    {
        for (c = 1; c <= 34; c++)
        {
            for (d = 1; d <= 34; d++)
            {
if((a + b + c + d == 34)
&&(a != b)&&(a != c)&&(a != d)&&(b != c)&&(b != d)&&(c != d)
&&(a<b) &&(b<c) &&(c<d) )
                {
document.write(a, " + ", b, " + ", c, " + ", d, "
                    = ", a + b + c + d, "<br />");
                }
            }
        }
    }
}
```

```
    }  
  }  
}  
  
</script>  
</body>  
</html>
```

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The above html file gives the following 86 results:

```
1 + 2 + 15 + 16 = 34  
1 + 3 + 14 + 16 = 34  
1 + 4 + 13 + 16 = 34  
1 + 4 + 14 + 15 = 34  
1 + 5 + 12 + 16 = 34  
1 + 5 + 13 + 15 = 34  
1 + 6 + 11 + 16 = 34  
1 + 6 + 12 + 15 = 34  
1 + 6 + 13 + 14 = 34  
1 + 7 + 10 + 16 = 34  
1 + 7 + 11 + 15 = 34  
1 + 7 + 12 + 14 = 34  
1 + 8 + 9 + 16 = 34  
1 + 8 + 10 + 15 = 34  
1 + 8 + 11 + 14 = 34  
1 + 8 + 12 + 13 = 34  
1 + 9 + 10 + 14 = 34  
1 + 9 + 11 + 13 = 34  
1 + 10 + 11 + 12 = 34  
2 + 3 + 13 + 16 = 34  
2 + 3 + 14 + 15 = 34  
2 + 4 + 12 + 16 = 34  
2 + 4 + 13 + 15 = 34  
2 + 5 + 11 + 16 = 34  
2 + 5 + 12 + 15 = 34  
2 + 5 + 13 + 14 = 34  
2 + 6 + 10 + 16 = 34  
2 + 6 + 11 + 15 = 34  
2 + 6 + 12 + 14 = 34  
2 + 7 + 9 + 16 = 34  
2 + 7 + 10 + 15 = 34  
2 + 7 + 11 + 14 = 34  
2 + 7 + 12 + 13 = 34  
2 + 8 + 9 + 15 = 34  
2 + 8 + 10 + 14 = 34  
2 + 8 + 11 + 13 = 34  
2 + 9 + 10 + 13 = 34  
2 + 9 + 11 + 12 = 34  
3 + 4 + 11 + 16 = 34  
3 + 4 + 12 + 15 = 34  
3 + 4 + 13 + 14 = 34  
3 + 5 + 10 + 16 = 34  
3 + 5 + 11 + 15 = 34  
3 + 5 + 12 + 14 = 34  
3 + 6 + 9 + 16 = 34  
3 + 6 + 10 + 15 = 34
```

$3 + 6 + 11 + 14 = 34$   
 $3 + 6 + 12 + 13 = 34$   
 $3 + 7 + 8 + 16 = 34$   
 $3 + 7 + 9 + 15 = 34$   
 $3 + 7 + 10 + 14 = 34$   
 $3 + 7 + 11 + 13 = 34$   
 $3 + 8 + 9 + 14 = 34$   
 $3 + 8 + 10 + 13 = 34$   
 $3 + 8 + 11 + 12 = 34$   
 $3 + 9 + 10 + 12 = 34$   
 $4 + 5 + 9 + 16 = 34$   
 $4 + 5 + 10 + 15 = 34$   
 $4 + 5 + 11 + 14 = 34$   
 $4 + 5 + 12 + 13 = 34$   
 $4 + 6 + 8 + 16 = 34$   
 $4 + 6 + 9 + 15 = 34$   
 $4 + 6 + 10 + 14 = 34$   
 $4 + 6 + 11 + 13 = 34$   
 $4 + 7 + 8 + 15 = 34$   
 $4 + 7 + 9 + 14 = 34$   
 $4 + 7 + 10 + 13 = 34$   
 $4 + 7 + 11 + 12 = 34$   
 $4 + 8 + 9 + 13 = 34$   
 $4 + 8 + 10 + 12 = 34$   
 $4 + 9 + 10 + 11 = 34$   
 $5 + 6 + 7 + 16 = 34$   
 $5 + 6 + 8 + 15 = 34$   
 $5 + 6 + 9 + 14 = 34$   
 $5 + 6 + 10 + 13 = 34$   
 $5 + 6 + 11 + 12 = 34$   
 $5 + 7 + 8 + 14 = 34$   
 $5 + 7 + 9 + 13 = 34$   
 $5 + 7 + 10 + 12 = 34$   
 $5 + 8 + 9 + 12 = 34$   
 $5 + 8 + 10 + 11 = 34$   
 $6 + 7 + 8 + 13 = 34$   
 $6 + 7 + 9 + 12 = 34$   
 $6 + 7 + 10 + 11 = 34$   
 $6 + 8 + 9 + 11 = 34$   
 $7 + 8 + 9 + 10 = 34$

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The patterns that the 4 partitions above make on the magic square below, in their respective order.

4	14	15	1
9	7	6	12
5	11	10	8
16	2	3	13

(1)      0 0 X X  
          0 0 0 0       $1 + 2 + 15 + 16 = 34$   
          0 0 0 0  
          X X 0 0

(2)      0 X 0 X  
          0 0 0 0       $1 + 3 + 14 + 16 = 34$   
          0 0 0 0  
          X 0 X 0

(3)      X 0 0 X  
          0 0 0 0       $1 + 4 + 13 + 16 = 34$   
          0 0 0 0  
          X 0 0 X

(4)      X X X X  
          0 0 0 0       $1 + 4 + 14 + 15 = 34$   
          0 0 0 0  
          0 0 0 0

(5)      0 0 0 X  
          0 0 0 X       $1 + 5 + 12 + 16 = 34$   
          X 0 0 0  
          X 0 0 0

(6)      0 0 X X  
          0 0 0 0       $1 + 5 + 13 + 15 = 34$   
          X 0 0 0  
          0 0 0 X

(7)      0 0 0 X  
          0 0 X 0       $1 + 6 + 11 + 16 = 34$   
          0 X 0 0  
          X 0 0 0

(8)      0 0 X X  
          0 0 X X       $1 + 6 + 12 + 15 = 34$   
          0 0 0 0  
          0 0 0 0

(9)      0 X 0 X  
          0 0 X 0       $1 + 6 + 13 + 14 = 34$   
          0 0 0 0  
          0 0 0 X

(10)     0 0 0 X  
          0 X 0 0       $1 + 7 + 10 + 16 = 34$   
          0 0 X 0  
          X 0 0 0

(11)     0 0 X X  
          0 X 0 0       $1 + 7 + 11 + 15 = 34$   
          0 X 0 0  
          0 0 0 0

(12)     0 X 0 X  
          0 X 0 X       $1 + 7 + 12 + 14 = 34$

0 0 0 0  
0 0 0 0

(13) 0 0 0 X  
X 0 0 0       $1 + 8 + 9 + 16 = 34$   
0 0 0 X  
X 0 0 0

(14) 0 0 X X  
0 0 0 0       $1 + 8 + 10 + 15 = 34$   
0 0 X X  
0 0 0 0

(15) 0 X 0 X  
0 0 0 0       $1 + 8 + 11 + 14 = 34$   
0 X 0 X  
0 0 0 0

(16) 0 0 0 X  
0 0 0 X       $1 + 8 + 12 + 13 = 34$   
0 0 0 X  
0 0 0 X

(17) 0 X 0 X  
X 0 0 0       $1 + 9 + 10 + 14 = 34$   
0 0 X 0  
0 0 0 0

(18) 0 0 0 X  
X 0 0 0       $1 + 9 + 11 + 13 = 34$   
0 X 0 0  
0 0 0 X

(19) 0 0 0 X  
0 0 0 X       $1 + 10 + 11 + 12 = 34$   
0 X X 0  
0 0 0 0

(20) 0 0 0 0  
0 0 0 0       $2 + 3 + 13 + 16 = 34$   
0 0 0 0  
X X X X

(21) 0 X X 0  
0 0 0 0       $2 + 3 + 14 + 15 = 34$   
0 0 0 0  
0 X X 0

(22) X 0 0 0  
0 0 0 X       $2 + 4 + 12 + 16 = 34$   
0 0 0 0  
X X 0 0

(23) X 0 X 0  
0 0 0 0       $2 + 4 + 13 + 15 = 34$   
0 0 0 0  
0 X 0 X

(24) 0 0 0 0  
0 0 0 0       $2 + 5 + 11 + 16 = 34$

X X 0 0  
X X 0 0

(25) 0 0 X 0  
0 0 0 X       $2 + 5 + 12 + 15 = 34$   
X 0 0 0  
0 X 0 0

(26) 0 X 0 0  
0 0 0 0       $2 + 5 + 13 + 14 = 34$   
X 0 0 0  
0 X 0 X

(27) 0 0 0 0  
0 0 X 0       $2 + 6 + 10 + 16 = 34$   
0 0 X 0  
X X 0 0

(28) 0 0 X 0  
0 0 X 0       $2 + 6 + 11 + 15 = 34$   
0 X 0 0  
0 X 0 0

(29) 0 X 0 0  
0 0 X X       $2 + 6 + 12 + 14 = 34$   
0 0 0 0  
0 X 0 0

(30) 0 0 0 0  
X X 0 0       $2 + 7 + 9 + 16 = 34$   
0 0 0 0  
X X 0 0

(31) 0 0 X 0  
0 X 0 0       $2 + 7 + 10 + 15 = 34$   
0 0 X 0  
0 X 0 0

(32) 0 X 0 0  
0 X 0 0       $2 + 7 + 11 + 14 = 34$   
0 X 0 0  
0 X 0 0

(33) 0 0 0 0  
0 X 0 X       $2 + 7 + 12 + 13 = 34$   
0 0 0 0  
0 X 0 X

(34) 0 0 X 0  
X 0 0 0       $2 + 8 + 9 + 15 = 34$   
0 0 0 X  
0 X 0 0

(35) 0 X 0 0  
0 0 0 0       $2 + 8 + 10 + 14 = 34$   
0 0 X X  
0 X 0 0

(36) 0 0 0 0  
0 0 0 0       $2 + 8 + 11 + 13 = 34$

0 X 0 X  
0 X 0 X

(37) 0 0 0 0  
X 0 0 0       $2 + 9 + 10 + 13 = 34$   
0 0 X 0  
0 X 0 X

(38) 0 0 0 0  
X 0 0 X       $2 + 9 + 11 + 12 = 34$   
0 X 0 0  
0 X 0 0

(39) X 0 0 0  
0 0 0 0       $3 + 4 + 11 + 16 = 34$   
0 X 0 0  
X 0 X 0

(40) X 0 X 0  
0 0 0 X       $3 + 4 + 12 + 15 = 34$   
0 0 0 0  
0 0 X 0

(41) X X 0 0  
0 0 0 0       $3 + 4 + 13 + 14 = 34$   
0 0 0 0  
0 0 X X

(42) 0 0 0 0  
0 0 0 0       $3 + 5 + 10 + 16 = 34$   
X 0 X 0  
X 0 X 0

(43) 0 0 X 0  
0 0 0 0       $3 + 5 + 11 + 15 = 34$   
X X 0 0  
0 0 X 0

(44) 0 X 0 0  
0 0 0 X       $3 + 5 + 12 + 14 = 34$   
X 0 0 0  
0 0 X 0

(45) 0 0 0 0  
X 0 X 0       $3 + 6 + 9 + 16 = 34$   
0 0 0 0  
X 0 X 0

(46) 0 0 X 0  
0 0 X 0       $3 + 6 + 10 + 15 = 34$   
0 0 X 0  
0 0 X 0

(47) 0 X 0 0  
0 0 X 0       $3 + 6 + 11 + 14 = 34$   
0 X 0 0  
0 0 X 0

(48) 0 0 0 0  
0 0 X X       $3 + 6 + 12 + 13 = 34$

0 0 0 0  
0 0 X X

(49) 0 0 0 0  
0 X 0 0       $3 + 7 + 8 + 16 = 34$   
0 0 0 X  
X 0 X 0

(50) 0 0 X 0  
X X 0 0       $3 + 7 + 9 + 15 = 34$   
0 0 0 0  
0 0 X 0

(51) 0 X 0 0  
0 X 0 0       $3 + 7 + 10 + 14 = 34$   
0 0 X 0  
0 0 X 0

(52) 0 0 0 0  
0 X 0 0       $3 + 7 + 11 + 13 = 34$   
0 X 0 0  
0 0 X X

(53) 0 X 0 0  
X 0 0 0       $3 + 8 + 9 + 14 = 34$   
0 0 0 X  
0 0 X 0

(54) 0 0 0 0  
0 0 0 0       $3 + 8 + 10 + 13 = 34$   
0 0 X X  
0 0 X X

(55) 0 0 0 0  
0 0 0 X       $3 + 8 + 11 + 12 = 34$   
0 X 0 X  
0 0 X 0

(56) 0 0 0 0  
X 0 0 X       $3 + 9 + 10 + 12 = 34$   
0 0 X 0  
0 0 X 0

(57) X 0 0 0  
X 0 0 0       $4 + 5 + 9 + 16 = 34$   
X 0 0 0  
X 0 0 0

(58) X 0 X 0  
0 0 0 0       $4 + 5 + 10 + 15 = 34$   
X 0 X 0  
0 0 0 0

(59) X X 0 0  
0 0 0 0       $4 + 5 + 11 + 14 = 34$   
X X 0 0  
0 0 0 0

(60) X 0 0 0  
0 0 0 X       $4 + 5 + 12 + 13 = 34$



X 0 0 0  
0 0 0 X

(61) X 0 0 0  
0 0 X 0       $4 + 6 + 8 + 16 = 34$   
0 0 0 X  
X 0 0 0

(62) X 0 X 0  
X 0 X 0       $4 + 6 + 9 + 15 = 34$   
0 0 0 0  
0 0 0 0

(63) X X 0 0  
0 0 X 0       $4 + 6 + 10 + 14 = 34$   
0 0 X 0  
0 0 0 0

(64) X 0 0 0  
0 0 X 0       $4 + 6 + 11 + 13 = 34$   
0 X 0 0  
0 0 0 X

(65) X 0 X 0  
0 X 0 0       $4 + 7 + 8 + 15 = 34$   
0 0 0 X  
0 0 0 0

(66) X X 0 0  
X X 0 0       $4 + 7 + 9 + 14 = 34$   
0 0 0 0  
0 0 0 0

(67) X 0 0 0  
0 X 0 0       $4 + 7 + 10 + 13 = 34$   
0 0 X 0  
0 0 0 X

(68) X 0 0 0  
0 X 0 X       $4 + 7 + 11 + 12 = 34$   
0 X 0 0  
0 0 0 0

(69) X 0 0 0  
X 0 0 0       $4 + 8 + 9 + 13 = 34$   
0 0 0 X  
0 0 0 X

(70) X 0 0 0  
0 0 0 X       $4 + 8 + 10 + 12 = 34$   
0 0 X X  
0 0 0 0

(71) X 0 0 0  
X 0 0 0       $4 + 9 + 10 + 11 = 34$   
0 X X 0  
0 0 0 0

(72) 0 0 0 0  
0 X X 0       $5 + 6 + 7 + 16 = 34$

X 0 0 0  
X 0 0 0

(73) 0 0 X 0  
0 0 X 0       $5 + 6 + 8 + 15 = 34$   
X 0 0 X  
0 0 0 0

(74) 0 X 0 0  
X 0 X 0       $5 + 6 + 9 + 14 = 34$   
X 0 0 0  
0 0 0 0

(75) 0 0 0 0  
0 0 X 0       $5 + 6 + 10 + 13 = 34$   
X 0 X 0  
0 0 0 X

(76) 0 0 0 0  
0 0 X X       $5 + 6 + 11 + 12 = 34$   
X X 0 0  
0 0 0 0

(77) 0 X 0 0  
0 X 0 0       $5 + 7 + 8 + 14 = 34$   
X 0 0 X  
0 0 0 0

(78) 0 0 0 0  
X X 0 0       $5 + 7 + 9 + 13 = 34$   
X 0 0 0  
0 0 0 X

(79) 0 0 0 0  
0 X 0 X       $5 + 7 + 10 + 12 = 34$   
X 0 X 0  
0 0 0 0

(80) 0 0 0 0  
X 0 0 X       $5 + 8 + 9 + 12 = 34$   
X 0 0 X  
0 0 0 0

(81) 0 0 0 0  
0 0 0 0       $5 + 8 + 10 + 11 = 34$   
X X X X  
0 0 0 0

(82) 0 0 0 0  
0 X X 0       $6 + 7 + 8 + 13 = 34$   
0 0 0 X  
0 0 0 X

(83) 0 0 0 0  
X X X X       $6 + 7 + 9 + 12 = 34$   
0 0 0 0  
0 0 0 0

(84) 0 0 0 0  
0 X X 0       $6 + 7 + 10 + 11 = 34$

0 X X 0  
0 0 0 0

(85)

0 0 0 0  
X 0 X 0  
0 X 0 X  
0 0 0 0

$$6 + 8 + 9 + 11 = 34$$

(86)

0 0 0 0  
X X 0 0  
0 0 X X  
0 0 0 0

$$7 + 8 + 9 + 10 = 34$$