How to Mentally Calculate the Day of the Week for Any Date

Adapted from http://www.quincunx.org/calendar/index.htm

- **The Basic Steps** – **Example Date is July 13th, 2004**
  - The Tricky Part
    - Remove multiples of 28 (28, 56, 84) from the last 2 digits of the year (in this case none)
    - Divide the resulting number by 4 and drop the decimal part (4 ÷ 4 = 1)
      - If you don't want to mess with decimals, just use the multiple of 4 below the last 2 digits of the year and then divide by 4
    - Add the resulting number to the number from the previous step (4 + 1 = 5)
      - After calculating this you can remove multiples of 7
  - Get the corresponding code for the month (=5)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
6	2	2	5	0	3	5	1	4	6	2	4

    - If it is a leap year AND the month is January or February, subtract 1 from the total
    - Leap years are the years evenly divisible by 4 (unless it ends in 00 and is a multiple of 400)
  - Get the corresponding code for the century (=0)

1700s	1800s	1900s	2000s	2100s	2200s
+5	+3	+1	+0	-2	-4

  - Note the day (=13)
    - You can remove multiples of 7 in order to keep the math simple
  - Add all the resulting numbers together (5 + 5 + 0 + 13 = 23)
  - Remove multiples of 7 until a number from 1-7 is left (23 - *21* = 2)
  - The resulting number corresponds to the day of the week (2 = Tuesday)

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	*0*,7

- **Other things to take into account**
  - This algorithm is only valid for the Gregorian calendar which began on September 14, 1752.
  - If during the calculation you get 0 or negative numbers, just add seven until you get a number from 1-7.
  - By subtracting multiples of 28 from the last two digits of the year the largest number you will have to work with will be 27
  - You can subtract multiples of 7 to any of the resulting numbers to make them easier to work with
  - You may want to add multiples of 7 to the month codes to make them easier to remember
    - For example, August is the 8th month and 1 + 7 = 8
    - Or Christmas is December 25th and 4 + 21 = 25
  - Remember that when adding a quarter of the year onto itself, if the quarter of the year is not a whole number, simply ignore the decimals. Do not round up. Therefore 27/4 = 6.75 = 6, and 2/4 = 0.5 = 0.

Year # Minus 28x	Year # Plus a ¼	Year # Minus 7s
27	33	5
26	32	4
25	31	3
24	30	2
23	28	0
22	27	6
21	26	5
20	25	4
19	23	2
18	22	1
17	21	0
16	20	6
15	18	4
14	17	3
13	16	2
12	15	1
11	13	6
10	12	5
9	11	4
8	10	3
7	8	1
6	7	0
5	6	6
4	5	5
3	3	3
2	2	2
1	1	1
0	0	0

Examples

The thought process for a date such as 20/12/1967 should be as follows: (explanations are in parentheses)

67- 56 = **11**	(Take multiples of 28 from the year - 84, 56 or 28)
11 + 2 = **13**	(Add a quarter of the nearest multiple of 4 below the number, in this case the nearest multiple is 8, so a quarter of that is 2)
13 - 7 = **6**	(Take away 7 or multiples of 7. This leaves us the year code)
December = **4**	(The code for the month from the table above)
20 - 14 = **6**	(Take away 7 or multiples of 7 from the day.)
6 + 4 + 6 = **16**	(Add the codes for the year, the month and the day)
16+1=**17**	(Add 1 if the date is in the 1900s)
17 - 14 = **3**	(Take away 7 or multiples of 7)
3 = **Wed**	(The final number indicates day of the week)

For a date in 2000, 2001, 2002 or 2003, remember that the year code is simply the last digit, so for a date in any of these years, we already know the year code.

So, to work out a date in 2000, we forget the year code: for example 4th August 2000

August = 1	(The code for the month)
1+4=5	(Add the codes for the month and the day)
5 = Friday	(The final number indicates day of the week)