MATHCOUNTS® Problem of the Week Archive

The Day That Goes on Forever – March 11, 2019

Problems & Solutions

March 14 has been dubbed Pi Day. That's because March 14 is often written 3/14, and a decimal approximation of pi is 3.14. But that's only if you use decimals and our style of writing dates. In some countries, it's customary to list the date first followed by the month; for example, March 14 would be 14-3 in some places. Consequently, some places celebrate Pi Approximation Day on July 22, because that date can be written as 22-7, and a fractional approximation of pi is 22/7. What percentage of the year occurs between Pi Day and Pi Approximation Day? Express your answer to the nearest whole number.

There are 17 days in March after Pi Day. Then, there are 30 days in April, 31 in May, 30 in June and 22 in July, for a total of 17 + 30 + 31 + 30 + 22 = 130 days. So, about 130/365 ≈ 0.356 ≈ ***36****%, of the year occurs between these two dates.*

To twelve decimal places, pi is 3.141 592 653 589 793 … What percent of the year has passed on 3/14 at 1:59:26 a.m.? Express your answer to the nearest tenth.

From January 1 through March 13, in a non-leap year, there are 31 + 28 + 13 = 72 days. The time 1:59:26 is 34 seconds less than two hours, or 3600 × 2 − 34 = 7166 seconds = 7166/86,400 = 3583/43200 day. So, 72 + 3583/43,200 days have passed, which is approximately (3,113,983/43,200)/365 ≈ 0.1974875 ≈ ***19.7****%, of the year.*

It is said that, "Love is like pi - natural, irrational, and very important." And a famous quote asks, "How do I love thee? Let me count the ways." In 2016, Peter Trueb did just that - counted the number of ways to love pi. His homemade supercomputer calculated 22,459,157,718,361 fully verified digits of pi in 105 days. At that rate, how many digits were calculated every second? Express your answer to the nearest whole number.

Since there are 60 × 60 × 24 = 86,400 seconds per day, there are 86,400 × 105 = 9,072,000 seconds in 105 days. Peter's computer calculated 22,459,157,718,361/9,072,000 ≈ ***2,475,657*** *digits every second.*

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