

## AMC10 2019 A4

Melanie computes the mean  $\mu$ , the median  $M$ , and the modes of the 365 values that are the dates in the months of 2019. Thus her data consists of 12 1s, 12 2s, ... , 12 28s, 11 29s, 11 30s, and 7 31s. Let  $d$  be the median of the modes. Which of the following statements is true?

- A.  $\mu < d < M$    B.  $M < d < \mu$    C.  $d = M = \mu$    D.  $d < M < \mu$    E.  $d < \mu < M$

$d$  obviously must be less than  $M$ , so we can rule out (B) and (C). Since there are 365 entries,  $M$  is the 183rd number, which lies between  $15 \times 12 + 1$  (180) and  $16 \times 12$  (192). Therefore,  $M=16$ . We can also see that  $d = 14.5$ . If we ignored the 11 29s, 11 30s, and 7 31s,  $\mu$  would also be  $=14.5$ . Because there are larger elements given, though, we can see that  $\mu$  is greater than  $d$ . On the other hand, since there are fewer 29s, 30s, and 31s than the rest of the numbers, the mean has to be lower than the median. So, the answer is E ( $d < \mu < M$ ).