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TIME

2008A

1. **Answer (D):** The machine worked for 2 hours and 40 minutes, or 160 minutes, to complete one third of the job, so the entire job will take $3 \cdot 160 = 480$ minutes, or 8 hours. Hence the doughnut machine will complete the job at 4:30 PM.

2015B

2. **Answer (B):** The first two tasks together took 100 minutes—from 1:00 to 2:40. Therefore each task took 50 minutes. Marie began the third task at 2:40 and finished 50 minutes later, at 3:30 PM.

2018A

3. **Answer (E):** Converting 10! seconds to days gives

$$\frac{10!}{60 \cdot 60 \cdot 24} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 120}{60 \cdot 120 \cdot 12} = \frac{9 \cdot 8 \cdot 7}{12} = 42.$$

Because 30 days after January 1 is January 31, 42 days after January 1 is February 12.

2006A

4. **(E)** The largest possible sum of the two digits representing the minutes is $5+9 = 14$, occurring at 59 minutes past each hour. The largest possible single digit that can represent the hour is 9. This exceeds the largest possible sum of two digits that can represent the hour, which is $1 + 2 = 3$. Therefore, the largest possible sum of all the digits is $14 + 9 = 23$, occurring at 9:59.

2010A

4. **Answer (B):** Because $412 \div 56$ is between 7 and 8, the reading will need 8 discs. Therefore each disc will contain $412 \div 8 = 51.5$ minutes of reading.

2016B

4. **Answer (B):** It took Zoey $1 + 2 + 3 + \cdots + 15 = \frac{15 \cdot 16}{2} = 120$ days to read the 15 books. Because $120 = 7 \cdot 17 + 1$, it follows that Zoey finished the 15th book on the same day of the week as the first, a Monday.

2010B

5. **Answer (B):** A month with 31 days has 3 successive days of the week appearing five times and 4 successive days of the week appearing four times. If Monday and Wednesday appear five times then Monday must be the first day of the month. If Monday and Wednesday appear only four times then either Thursday or Friday must be the first day of the month. Hence there are 3 days of the week that could be the first day of the month.

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