Old Faithful – July 27, 2020

Problems & Solutions

Old Faithful, a famous geyser in Yellowstone National Park, erupts approximately once every 77 minutes. (It used to erupt more frequently, but recent earthquakes have changed the geyser's plumbing, so it's not letting off a little steam as often as it used to.) Assuming that it spurts 8000 gallons of water each time, how many gallons will Old Faithful spurt in one year?

> *There are 365 × 24 × 60 = 525,600 minutes in a year, so the geyser will erupt 525,600/77 = 6825 times per year, approximately. This makes a total of 8000 × 6825 = **54,600,000** gallons spurted by Old Faithful per year.*

Predicting when Old Faithful will spurt *next* can be done by timing the previous eruption. If an eruption lasts *t* minutes, the next eruption will occur in approximately 12.5*t* + 33 minutes. If a 4-minute eruption begins at 11:23 a.m., at what time would you expect the next eruption to occur?

> *The eruption begins at 11:23 a.m., so it ends at 11:27 a.m. The next eruption should occur in 12.5(4) + 33 = 83 minutes (1 hour, 23 minutes). So, it will likely happen at about **12:50 p.m.***

Old Faithful is just one of hundreds of geysers in Yellowstone National Park. Yellowstone is a large park consisting of 3472 square miles of land. Of this land, 91% is in Wyoming, 7.6% is in Montana and 1.4% is in Idaho. How many square feet of Yellowstone is located in Idaho?

> *There are 5280^2 square feet in a square mile, so there are 5280^2 × 3472 × 0.014 = **1,355,113,267.2** square feet of Yellowstone land in Idaho.*

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