

# MATHCOUNTS<sup>®</sup> Problem of the Week Archive

## ***Blooms for Dahlia, Rose and Lily – April 22, 2024***

### ***Problems & Solutions***

In the spring of 2020, Dahlia created a flower bed and planted one daffodil. The following spring, three daffodils bloomed. In fact, each spring, from 2020 to 2023, the number of daffodils that bloomed in Dahlia's flower bed was 1, 3, 9 and 27, respectively. If this pattern continues, how many daffodils can Dahlia expect to bloom in the spring of 2024?

*It appears that each year after 2020, the number of daffodils that bloomed in Dahlia's garden was three times the number that bloomed the previous year. If this pattern continues, in 2024, Dahlia can expect there to be  $27 \times 3 = 81$  blooms.*

In the spring of 2020, Rose created a flower bed and planted two tulips. The following spring four tulips bloomed. Each spring, from 2020 to 2023, the number of tulips that bloomed in Rose's flower bed was 2, 4, 8 and 16, respectively. If this pattern continues, what is the absolute difference in the number of tulips and daffodils expected to bloom in Rose's and Dahlia's flower beds in 2024?

*It appears that every year since Rose planted two tulips in 2020, the number of tulips that bloomed was twice the number that bloomed the previous year. If this pattern continues, Rose can expect  $16 \times 2 = 32$  tulips to bloom in 2024. The difference in the number of tulips and daffodils that are expected to bloom in Rose's and Dahlia's gardens in 2024 is  $81 - 32 = 49$ .*

In the spring of 2020, Lily created a flower bed and planted three hyacinths. Each spring, from 2020 to 2023, the number of hyacinths that bloomed in Lily's flower bed was 3, 6, 10 and 15, respectively. If this pattern continues, what is the total number of hyacinths that will have bloomed in Lily's flower bed from the spring of 2020 through the spring of 2024?

*Lily planted 3 hyacinths (which bloomed) in 2020. In 2021, the number of hyacinths that bloomed was three more than the number that bloomed in 2020. In 2022, the number of blooms in Lily's garden was four more than the number of blooms in 2021, and in 2023, there were five more blooms than in 2022. If this pattern continues, Lily can expect the number of blooms in 2024 to be six more than in 2023, which would be  $15 + 6 = 21$  blooms. So, the total number of hyacinths that will have bloomed in Lily's garden from 2020 through 2024 was  $3 + 6 + 10 + 15 + 21 = 55$  hyacinths.*

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### ***Problems***

In the spring of 2020, Dahlia created a flower bed and planted one daffodil. The following spring, three daffodils bloomed. In fact, each spring, from 2020 to 2023, the number of daffodils that bloomed in Dahlia's flower bed was 1, 3, 9 and 27, respectively. If this pattern continues, how many daffodils can Dahlia expect to bloom in the spring of 2024?

In the spring of 2020, Rose created a flower bed and planted two tulips. The following spring four tulips bloomed. Each spring, from 2020 to 2023, the number of tulips that bloomed in Rose's flower bed was 2, 4, 8 and 16, respectively. If this pattern continues, what is the absolute difference in the number of tulips and daffodils expected to bloom in Rose's and Dahlia's flower beds in 2024?

In the spring of 2020, Lily created a flower bed and planted three hyacinths. Each spring, from 2020 to 2023, the number of hyacinths that bloomed in Lily's flower bed was 3, 6, 10 and 15, respectively. If this pattern continues, what is the total number of hyacinths that will have bloomed in Lily's flower bed from the spring of 2020 through the spring of 2024?