MATHCOUNTS® Problem of the Week Archive

Online App Store – September 27, 2021

Problems & Solutions

A particular online app store has three categories of apps available to download: $3 apps, $1 apps and free apps. There are no additional taxes or fees to download an app from this website. If Peyton wants to download equal numbers of apps in these three categories, what is the greatest number of apps she can download for $20?

> *The total cost to download one app in each category is 3 + 1 + 0 = $4. Peyton can do this 20 ÷ 4 = 5 times with $20. That's 5 apps in each of the three categories, for a total of 5 × 3 = **15** apps.*

Peyton first began downloading apps from this online app store in January. At that time, she decided against purchasing an annual subscription for $15.99. This subscription would have allowed Peyton to download an unlimited number of apps, in all three categories, for 12 months from the date the subscription was purchased. Since January, Peyton has downloaded six $3 apps, five $1 apps and four free apps from this online app store. If Peyton had purchased the annual subscription in January, how much could she have saved on these 15 downloads?

> *Without the subscription, six $3 apps, five $1 apps and four free apps cost Peyton 6 × 3 + 5 × 1 + 4 × 0 = 18 + 5 = $23 to download. If she had purchased the annual subscription, she could have saved 23 – 15.99 = $**7.01** on these 15 downloads.*

If Peyton still has not purchased the subscription, and she wants to spend exactly $10 to download seven apps, what is the greatest number of free apps she can download?

> *If Peyton downloads only one free app, she can spend exactly $10 on the remaining six apps by downloading two $3 apps and four $1 apps. If Peyton downloads two free apps, there is no way to spend exactly $10 on five $3 apps, five $1 apps or a combination of $3 and $1 apps. If Peyton downloads three free apps, she can spend exactly $10 on the remaining four apps by downloading three $3 apps and one $1 app. It is not possible to spend exactly $10 to download fewer than four paid apps from this online store. Therefore, the greatest number of free apps Peyton can download is **3** free apps.*

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